

ROOTED IN RESEARCH:
ANTHROPOLOGY AND DESIGN IN THREE COLLABORATIVE PROJECTS

A Project Report

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Master of Arts

by

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The Undersigned Graduate Committee Approves the Project Report Titled

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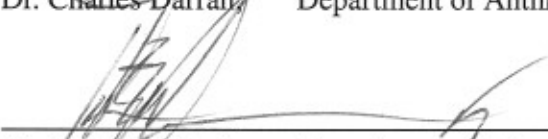
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ABSTRACT

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by Alicia N. Murphy

What roles can anthropology play in the design process? This report documents the anthropology-design relationship in three collaborative projects. It is an attempt to reduce the gap between research and design by creating a model in which design concepts produced are rooted in research. One, at an internship at Roche Diagnostics, industrial design students used ethnographic research to design products and services for people with type II diabetes. Two, an industrial design class used ethnographic reports to design office environments for Herman Miller, Inc. Three, anthropologists collected information about the SJSU community to inform changes in the built environment.

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Anthropology and Design

The relationship between anthropology and design has the potential to be symbiotic. Anthropology's approach, theory, and ethnographic methods can help designers produce more meaningful and successful designs; design can help frame anthropological studies and translate information about cultural practices into interventions. Design that disregards what people say and do can have wasteful, expensive, and potentially dangerous outcomes (Jain 2006).

Many companies acknowledge that ethnography is good for design, and many perform some kind of research activity before pursuing design activities. However, there is currently a gap between research and design (Zeisel 2006). This gap is wide when research is esoteric and unactionable; when research and design occur in isolation; and when the information being passed back and forth is poorly communicated or ill-timed. It is the ambiguous nature of the research-design relationship that renders it a topic of debate. How research is undertaken, interpreted, and used in the design process is not always clear. To learn about the design process in order to try to narrow the gap, I worked on three collaborative projects. Before describing these projects, it would be helpful to share a definition of the two fields.

Design and anthropology are both large fields with arguable definitions. Broadly defined, design is “the human capacity to shape and make our environment in ways without precedent in nature, to serve our needs and give meaning to our lives” (Heskett

2002:5). Design refers to both the process of creating as well as the outcomes. The design process is solution-driven and iterative (Cross 2006); it is an iterative process of imaging, presenting, and testing (Zeisel 2006); and it often includes framing problems, generating solutions through multiple representations, briefing, evaluating, reflecting, and refining (Lawson 2006).

Anthropology, on the other hand, “is concerned with understanding the 'other.' Typically anthropologists study the behavior, beliefs, and lifestyles of people in other cultures” (McGee and Warms 2007:1). More recently, applied anthropologists have used this knowledge for practical purposes such as needs assessments, program evaluations, as well as program, policy, and service design (Ervin 2005). Ethnography is an integral facet of anthropology and is a useful methodology for studying what people say and do. Ethnography refers to both the process of collecting information as well as a written description of a group of people. Many scholars have detailed the importance of ethnographic methods which include open ended, semistructured, and structured interviewing; direct and indirect observation; domain analysis; mapping etc. (Agar 1980; Bernard 2002; LeCompte and Schensul 1999; Pelto and Pelto 1978; Spradley 1979, 1980).

The literature that discusses the relationship between anthropology and design is limited. Most authors review one or the other or touch upon a facet of collaboration indirectly without exploring what a rich collaboration may look like. Some studies show how anthropology or ethnography can inform consumer research (Sunderland and Denny

2007) or marketing strategies (Mariampolski 2006). Some explore the cultural implications of social marketing projects (Andreasen 2006; Himmelgreen and Crooks 2005; Raval and Subramanian 2004). There is a body of literature that shows how researchers play a role in needs assessment which ultimately results in a design intervention (Reviere et al. 1996; Sankar and Luborsky 2003). Other texts examine the cultural meanings behind products (Csikszentmihalyi 1995; Miller 1998; Norman 2004) or the interplay between culture and design (Rapoport 1969; Shove et al. 2007; Thackara 2005). While these texts are important in understanding certain roles social science can play in design as well as the cultural meanings people place on their built environment and quotidian objects, they do not explore collaborative anthropology-design projects.

Texts that explore a rich collaboration between the social sciences and design, or that try to narrow the gap between research and design, are rare. They include Cross's (2006) *Designerly Ways of Knowing* which examines the design approach and compares it to approaches used in the humanities and sciences; McClusky and Darrah's (2007) *Leaving the Research to the Experts*, which lays out a framework for anthropology-design collaborations by comparing the core characteristics of both disciplines and using an ATM study and Herman Miller project to discuss their process, methods, and results; and Zeisel's (2006) *Inquiry By Design* which looks at the relationship between research and design as an iterative process that includes a series of feedback loops. Both the rarity of the literature on this subject and the questions raised by it are rationale for exploring it

further.

What should this collaboration aim to do? Anthropology examines the human perspective and can thus inform design from the bottom-up so that design solves problems as defined by various populations. Or better still, anthropology can study both the needs of a population *and* a company and identify points of alignment so that both parties benefit. This collaboration should aim for successful design, however, identifying success is a challenge because there are so many criteria by which to judge concepts. A design concept may be successful from one perspective and a failure from another. One might even argue that successful, innovative design incites controversy. Successful design informed by anthropology may reflect what people say and do or what they hope to accomplish. If a design concept truly fulfills a need, it may be seamlessly integrated into existing systems and solve the problems that they set out to solve, or it may be that the system itself is the problem that needs redesigning. Longevity may be another determining factor of successful design; good designs anticipate the future and are not simply created to be thrown away (or made to break). In any case, understanding the system and how it can be changed is an integral part of the process, and the odds of creating successful design should increase through successful collaborations between anthropology and design which come in the form of blurred boundaries, when both professionals understand how to use each other's methodologies to enhance their own work and when they work together throughout the project.

Where are the points of tension that impede a smooth anthropology-design relationship? Dourish (2006) writes that problems with ethnography in design include: the marginalization of theory, power relations between disciplines, a restricted model between technology and practice, and problems of representation and models. Anthropology and design each define and approach problems differently, they have different methods and theory, and many times have opposing objectives. Some of these differences can lead to conflict during collaboration. For example, anthropologists do not usually approach a challenge with the problem already defined. They are inductive and try to understand people's perspectives of the world. On the other hand, design is solution-driven, meaning the problem is simply a means to an end. Defining the problem is usually a creative part of the design process for the designer is often trained and expected to handle ill-defined or wicked problems (Buchanan 1995; Cross 2006).

Anthropologists aim to problematize, or challenge our preconceived notions of, categories and assumptions. This allows the researcher to uncover nuanced perspectives, however, it is difficult to make progress in design with this approach because at some point a decision has to be made for the project to move forward. Designs should be challenged, but they must also be evaluated and will not always benefit from continual critique.

Another tension, from the anthropologist's point of view, spawns from the designer's "reliance on generating fairly quickly a satisfactory solution, rather than on any

prolonged analysis of the problem” (Cross 2006). Traditionally, anthropological studies have unfolded over months or years. This is changing with the increasing number of anthropologists who work for corporations under limited time frames or conduct rapid appraisal (Kedia and Van Willigen 2005:13). However, collaborators should still be aware of this issue.

Methods of communication differ between anthropologists and designers as well. Lawson (2006) argues that the historical separation between designer and maker augmented the importance of drawing to communicate ideas. Drawing is also an important part of the design process today for it encourages experimentation (Lawson 2006:26). Anthropological findings, on the other hand, emerge during the writing process, and although visual anthropology is a growing sub-discipline, anthropological studies are not as visually driven as design projects. Jones (2006) may have found a possible compromise with her “experience model” which brings ethnography and design closer. The experience model is the result of three main activities: collecting a rich set of data from the emic perspective, analyzing patterns of behavior, and reducing phenomena to essential components in order to visually depict them.

Zeisel (2006) asserts that knowing what different forms of information are useful to designers and when in the design process can stimulate design innovation. McClusky (2007) often refers to a “back and forth” between research and design. Ideally, the researcher and designer would both be involved in a project for its duration, allowing a

constant flow of communication between the two. Then the conversation could evolve as the project progressed. Timing (when knowledge is communicated) affects the significance and depth of research-design interactions and has a direct impact on the outcome of the project. Zeisel (2006) suggests three stages during which research can enhance design: planning or programming, design review or evaluation, and post-occupancy evaluation.

Another issue deals with timing in a different sense. Anthropologists examine the here and now and designers create for the future. Lawson (2006) writes that designers have a prescriptive rather than a descriptive job; they are “futuurologists.” What are ways anthropologists, who collect data on the present, can support design for the future?

Both anthropology and design are broad fields with complex histories, methodologies, and approaches. Focusing on the relationship between the disciplines, I worked on three projects that aimed to incorporate research into the design process in order to enhance the design outcomes. I took into consideration the literature mentioned above regarding the design process, anthropological methods, as well as the points of tension during collaboration and what a successful collaboration might look like.

Anthropology and Design in Three Projects

I worked on three projects that focused on the relationship between anthropology and design to solve real world problems. With each project, my understanding of this relationship and my participation in collaboration evolved. In summer 2008, I was an

intern at Roche Diagnostics in Palo Alto, CA and worked with industrial design interns to design products and services for people living with type II diabetes. I used this work experience as background knowledge while I prepared to do the following two projects. In fall 2008, I participated in John McClusky's class, DSID 128: Advanced Projects, in which I worked with industrial design students to develop work environment concepts for Herman Miller, Inc. Since the end of fall 2007, I worked with faculty and students in Anthropology and Nutrition Science on the Healthy Eating Active Living (HEAL) Grant for Kaiser Permanente which culminated in a charrette, or design workshop, in April 2009. All three projects focused on connecting research and design. However, they differed in that during the first two projects I worked directly with designers throughout the process, using research that had already been conducted. During the HEAL project our team conducted research and organized new design activities that incorporated that research. The charrette in particular used anthropology to create a new social dimension in the design process.

While I worked at Roche, four days a week for about ten weeks, my main goal was to use ethnographic research that had already been conducted to inform the design of products and services. I had to be the voice of the research while still contributing to concept generation. My focus was not necessarily always on the final design (as it may have been for the design interns) but how to use ethnographic data at various points in the design process. Various stages as described by the designers might include:

brainstorming, ideation, concept sketching, evaluation, concept builds, refinement, and presentation. My intent was to document my experiences along the way so that I could learn from them and contribute to future projects.

The DSID 128 Herman Miller project occurred fall semester 2008, Tuesdays and Thursdays, 8:30 - 11:30 am. Priyanka Mehan, Applied Anthropology master's student, and I conducted participant-observation and had many conversations with the industrial design students, ranging from superficial to in-depth, in order to document the design process, understand where and how ethnography is useful in design, and to help inform and critique the students' work. I focused on the question: How can anthropologists collaborate with designers?

There are many projects that fall under the HEAL grant. The overarching goal of the HEAL project was to conduct research in order to design interventions in the built environment that support wellness. The charrette, or design workshop, was a key facet of the anthropology-design relationship in this project. It was an interdisciplinary collaborative workshop with urban and regional planning, industrial design, health science, and anthropology students who used HEAL research to design the future(s) of San José State University.

In this report, I attempt to give equal treatment to each project so that comparisons can be made across my experiences. I consistently describe background information, goals, outcomes, and lessons learned for each project. Since there are structural

differences between projects, my written description necessarily changes to best document each project. At Roche, the project was not bounded by precise time lines. Instead the focus was on the types of activities that needed to occur in order to produce meaningful design concepts. We had flexible work schedules, and although most of us left at the end of summer, two design interns continued to work on the project over the next year. Also, I include specific recommendations with each activity description in this section because it was my role in the project to document activities and ways to improve them. DSID 128, on the other hand, was a class that was constrained by a 16 week semester schedule, therefore, I wrote this section of the report following a syllabus format and described what occurred each week. The focus of the HEAL project was research activities that led to design interventions on campus so I describe each research activity and then how we used those activities to prepare for the culminating charrette, or design workshop.

Project 1: Roche Internship

At Roche Diagnostics, John McClusky, six SJSU industrial design interns, and I worked with the New Concept Incubator (NCI) department, which, as I understand it, is a radical departure from Roche's traditional product development structure. Typically, they do not hire industrial designers or conduct ethnographic research, and Roche has a reputation (even among their own) for being incredibly conservative and bureaucratic. Our team reported primarily to Marco De Polo, who comes from an engineering

background and is well known for designing a revolutionary insulin pump. The main goals of the project were presented the first day as follows: to understand type II diabetics; uncover all customer (type II diabetic) needs; determine which needs are unmet; design concepts to address unmet needs; prototype products (semi-functional, functional, and storyboards that explain the platforms and features); and document the process, insights, and findings.

This project was chosen opportunistically. Chuck Darrah knew I was interested in working with designers, and his colleague, John McClusky, was in the midst of organizing this internship for his own students and wanted to add an anthropologist to the team. The project activities were mostly predetermined by De Polo and McClusky, however, there were times when we had the freedom to provide input and influence the activities. It gave me the dual experience of using anthropology to work on issues surrounding diabetes as well as to understand and participate in the design process. For the purposes of this report, I will focus on the latter.

My role in the project was deemed “champion of the research,” and I worked closely with the designers to ensure that their concepts were informed by the research that had already been conducted. The NCI had hired outside consultants to conduct ethnographic interviewing and observation as well as a large survey. All the documentation that follows is a reflection of my experience in the field as I worked with designers on a day to day basis. This experience took the form of naïve brainstorming,

food logging, a nutrition workshop, field trips, creating mind maps, product benchmarking, product immersion, reverse brainstorming, concept evaluation, concept clustering and combining, and many discussions and presentations.

In order to meet the challenge of understanding people living with type II diabetes and designing concepts for their unmet needs as described in the ethnographic research, we tried to facilitate a continuous dialog between the research insights and the design activities. Without this constant back and forth, priorities other than “user needs” dominate (McClusky and Darrah 2007). McClusky suggested that another way of looking at this dialog is to consider the activities in this project as falling under activities of understanding, activities of response, and activities of testing. These are not discrete endeavors for they constitute an iterative, and sometimes overlapping, flow. Understanding refers to what we learned; response means what was produced based on research insights; and testing refers to checking both the design logic and research knowledge.

Immersion Workshop/Overview

Leaders of the project used the immersion workshop to introduce the SJSU interns to the New Concept Incubator and to give them an overview of the project. Ethnographic research highlights were presented from interview video footage and poster boards. De Polo covered general statistics on the prevalence of diabetes in the US which gave a large-scale view of the problem. He also explained some of the research frameworks, stressing

that many existing products and services address the functional aspect but not the spiritual or emotional aspects of diabetes. An endocrinologist on staff gave a presentation on diabetes from a biological perspective, and another member on the team gave a demonstration on how to use a glucometer, the instrument that measures blood sugar. This brief overview provided us with a basic understanding of diabetes, the research that had already been completed, and our goals for the summer.

Project Begins (Emphasis on Activities of Understanding)

The students started the project by undertaking several tasks to gain insight on diabetes management. Although the beginning of the students' work was more heavily weighted with activities of understanding, brainstorming and sketching occurred throughout the process. The students used sketching to depict what they understood from the research, as a way of raising questions or responding to the research, as a way of ramping up the creative juices, or as a placeholder for a product that may be developed after more understanding of the issues occurred. Naïve brainstorming and broad discussions of diabetes exposed the students' assumptions about obstacles to diabetes management.

Immersion activities such as the field trip, nutrition workshop, time line activity, food logging etc. added to the students' understanding of diabetes, and they responded to this knowledge during brainstorming. The students agreed to take turns facilitating, and the brainstorming evolved over several days as the students learned more about diabetes.

Naïve Brainstorming

Goal: To generate as many solutions as possible before much knowledge is gained, to share all ideas without judgment, and as John McClusky pointed out the first day, to embrace the students' naiveté at a stage in the project when they were not too constrained by research. This served the dual purpose of allowing the designers to acknowledge any preconceived notions they had about diabetes, and it had an empowering effect on the participants because all their ideas were valued.

Outcome: McClusky led the first brainstorm during which the students called out what they thought were major jobs or obstacles to diabetes management. Once the group had acquired a healthy amount of problems, McClusky selected one job and all the students brainstormed solutions on sticky notes. Naïve brainstorming happened in several rounds during the first two weeks. Each round focused on a different topic. Obviously people could not ignore information they gradually acquired, meaning that each new activity of understanding tightened the focus on solutions to obstacles of diabetes management.

Lessons learned: At this point, the students learned that there was a vast array of solutions to diabetes management issues ranging from unconventional to logical. The more the students immersed themselves in the research, the more focused the brainstorming sessions became. They also felt firsthand “brainstorm burnout.” After about an hour or so brainstorms lost steam.

Recommendations: It may be useful to play with ways of capturing and organizing this

information. At some points, the group focused on brainstorming problems (instead of finding them in the research), at other times the focus was on generating solutions. Trying new ways of brainstorming kept the sessions fresh; experimenting should be continued in future brainstorms.

All of the sticky notes produced within the first couple weeks were grouped as “naive brainstorming” organized by topic. It seemed that some of the ideas on the naïve brainstorming wall were valid and plausible, however, they were indistinguishable from the hundreds of other ideas on the wall. There must be a better way to organize concepts. Is there a way of filtering plausible ideas from not so plausible based on different criteria such as qualitative research patterns, frequency of similar ideas, Roche's goals, or something else? Could it have been categorized chronologically so that the evolution of ideas would be more tangible?

Ideation Matrix

Goal: To capture a wide range of contexts, situations, and places in which obstacles to diabetes management arise as a way of generating different solutions.

Outcome: During the first week we reviewed the Ideation Matrix that McClusky had compiled. It presented obstacles to diabetes management and the locations and situations where they occur. It also captured some complex social systems within one clear situational phrase. The students used it minimally (mostly indirectly) in the beginning to facilitate brainstorming sessions.

Lessons learned: Diabetes care does not always happen in obvious places like the kitchen, grocery store, or doctor's office. Thinking of a range of situations, seemingly unrelated to diabetes, helps generate more concepts.

Recommendations: This is an effective tool to escape the trap of designing the same concepts over and over. This could have been utilized more, so why was it not? Perhaps it captured such a broad array of issues that it was seen as an inappropriate tool for focused development. It could be useful to revisit this tool to see if it could be edited and used for design refinement, storyboards, or concept evaluation.

Food Logging

Goal: To understand the challenges to logging food and monitoring diet and to gain self-awareness of food intake.

Outcome: Food logging is an activity that started at the very beginning of the project. An NCI team member gave each student a paper food log in which they were asked to document everything they put into their bodies with the goal of learning the challenges behind this “job” of diabetes management. People struggled to accurately and completely fill out the log. The insights were discussed and presented to the NCI.

Lessons learned: Reading about the difficulties of logging food felt very different than knowing the difficulties from firsthand experience. This method could be useful in other projects.

Recommendations: There could have been a direct link from the activity, which was

designed to educate the students and broaden their understanding of the difficulties of nutrition tracking, to a brainstorming session. Or the students could have at least revisited the findings they documented from this activity so that this learning experience might have more directly influenced their own concepts.

Time Line Activity

Goal: To examine, from a micro view, what it is like for someone living with diabetes and to learn one of the interview methods used in ethnographic data collection.

Outcome: During the time line activity, personas, created by members of the NCI based on people living with type II diabetes, were distributed to pairs of students. The personas were essentially character descriptions based on real people that very briefly outlined life events and emotional states. Each pair had pictures and stickers with images and words to help them document their persona's life events on a time line. The time line encapsulated past, present, and future as well as negative, neutral, and positive events. The pairs presented to the group immediately following the activity, and then insights were discussed, recorded, and presented a few days later to the NCI.

Lessons Learned: This approach was fairly similar to a life history in anthropology in which the researcher traces events and challenges as they unfold over a lifetime in order to understand the bigger picture, context, and patterns that cannot be observed in a single interview or even a couple weeks or months. The difference is that life histories are learned through extensive interviewing with key informants, and personas are very brief

outlines that may be loosely based on one or more people. The added benefit to the time line activity is that life events are explained in a very visual way which lends itself well to the design method of sketching as a thought process (Lawson 2006).

Recommendations: None. This exercise served the purpose of teaching the students a method used in data collection from the viewpoint of the interviewee as well as familiarizing them with a personal story related to diabetes.

Getting to Know the Research

Goal: To read transcripts and watch interview videos to gain a nuanced view of diabetes management; to familiarize the students with potential users whom they should keep in mind while designing products and services; to compare their insights and opportunities.

Outcome: The students initially swept the data searching for insights, opportunities, obstacles, patterns, and surprises. This primary information served as a foundation to return to with specific questions and allowed them to start generating concepts based on research immediately. Charged as “champion of the research,” I tried to dive deeper into the data by spending more time reading the transcripts carefully and studying the research methods along with the research results and insights. (This happened over several weeks.) This produced more nuanced information that could be translated into design concepts or could be used to revise students' initial ideas.

Individual students took notes on the transcripts and videos and then came together to discuss important points with the group. They tried to reduce lengthy passages

into succinct points. These were then reduced to shorter bullets for a presentation. This had the effect of watering down the insights. De Polo asked the group to add more detail so that someone unfamiliar with the project could read and understand the main points.

Lessons learned: Some designers found it difficult to gather the information they wanted from raw transcripts. Watching the videos was tedious for students who were looking for broader truths. It seemed that they were waiting for an epiphany to leap from the screen. Some found it unproductive because the interesting kernels of information were few and far between. Others told me that they were inspired by hearing real life experiences and found motivation in stories with which they could relate. Some felt that the video was more effective than reading transcripts or poster boards because they could make visual observations about the home environment, relationships, and social interactions by watching people's expressions, mannerisms, and objects they use and have around them.

Recommendations: This is an important part of the immersion process and cannot be skipped. However, it seemed more effective during the overview/immersion workshop the first day because the Roche team prepared concise clips that made clear points about a certain attitude or idea. There is a lot of dead air during the videos, so it would have been helpful to label various clips so that certain points were easy to find and understand.

Also, the team was only allowed to see the original researchers' conclusions after they had been going through the research for a couple weeks on their own. During that time, it felt as if the students were no longer in the naïve brainstorming phase but they also had not

quite yet reached a clear understanding of the issues from the research.

I would have liked more time to dive into the research earlier. The team had a couple afternoons to go over hundreds of pages and hours of video, meaning if an individual wanted to further explore research they had to do so outside of work. However, I learned a great deal from the naïve brainstorming and felt torn between spending time on that or going deeper into the research. By participating in naïve brainstorming I could more easily identify my own prejudgments as well as the students' assumptions about the project, particularly the ideas that revealed themselves verbally during brainstorming which were not recorded by the designers. I usually dove deeper into the research in my spare time because I wanted to ensure that the claims I made about the research were grounded in patterns from the transcripts and video footage themselves and not from brainstorming.

Many interview exercises were hands-on activities and the results were very visual. However, when the group reviewed the research, many insights were boiled down to vague written statements, spoiling the intention behind the research which was intentionally crafted to lend itself to design methods. It might have been beneficial to use the visual representations which resulted from the interviews, such as the time line posters and Velcro activity models, as brainstorming triggers.

Nutrition Workshop

Goal: To learn what “healthy, balanced diet” means, how to read nutrition labels as well

as to understand obstacles to healthy eating from a diabetes perspective.

Outcome: An NCI team member lectured the students about general nutrition, serving sizes, and portions as well as information specific to diabetes care such as appropriate servings of carbohydrates per meal.

Lessons learned: Similar to food logging, this method taught the students firsthand how difficult it is to manage nutrition.

Recommendations: As with other activities of understanding, the goal here could have been expanded to include feedback loops that would have promoted direct incorporation of these insights into the final concepts.

Field Trip

Goal: To understand the challenges people with diabetes face when they purchase food. To learn about the context and environment in which products and services could be used to aid diabetes management.

Outcome: Two teams of three people explored local restaurants and markets using guidelines provided by the NCI. Lessons learned were discussed, recorded, and presented.

Lessons learned: See nutrition workshop (above).

Recommendations: See nutrition workshop (above).

Presentation and Mind Map

Goal: To succinctly present insights and opportunities from the activities of understanding to date: naïve brainstorming, research, food log, time line activity, nutrition

workshop, and field trip.

Outcome: The students presented a PowerPoint displaying their main findings in the form of bullet points. They received revision notes from De Polo instructing them to flesh out the bullet points in enough detail so that anyone would be able to read the points and understand the issues. He also recommended that the students display their points on a poster board so that they could refer to it throughout the design process. A couple students transformed the bullet points into a poster sized mind map, connecting insights and opportunities from each activity of understanding. A mind map is a diagram used to connect words or ideas around a central theme. Unfortunately, it was not a terribly successful format for this set of ideas.

Lessons learned: It was difficult to go from research transcripts to summaries to bullet points only to return to more fleshed out statements. It felt like a game of telephone where nuanced information is sure to be distorted or lost. On one hand, it was a learning experience for the students to figure out how to present information, however, it was frustrating to spend several hours agreeing on insights and developing a presentation only to receive specific deliverables after the work had been completed.

There was also mild frustration amongst the students because the insights and opportunities did not always fit the mind map format. The mind map lent itself well to making direct connections between insights and opportunities, however, the research insights and opportunities were extrapolated independently so they did not always match

up, making the mind map messy.

Recommendations: More instructions, deliverables, and expectations up front would have strengthened the presentation.

Product Benchmarking

Goal: To describe and evaluate current products and services that relate to diabetes management.

Outcome: The students looked for products and services that fell under the main categories: fitness, diet, stress, and blood glucose management. They divided topics amongst themselves and individually scoured the Internet to compare products and services. They recorded and compared cost, ease of use, pros and cons, what surprised them, what they thought was missing etc. They took notes in personal formats and then received deliverables, or expected outcomes, from De Polo that stated which criteria to fit into a presentation of their findings. They first presented to each other looking for further questions and gaps in their findings. Later they presented to the NCI.

Lessons learned: The students began to realize which product niches were flooded; where there were opportunities for better products; and which features they found exciting or salient to diabetes management.

Recommendations: Since the students only found products and services within these categories, it made me wonder if we were stuck “inside the box.” Is it possible that we missed products that could benefit people with diabetes that do not relate to typical

categories of exercise, diet, blood glucose etc.?

Deliverables were given after much work had been completed. These cycles of revision can be beneficial, but they are also deflating as some students felt like they put in a lot of work without any direct benefit or increased understanding. It could have been useful to go more in depth during product benchmarking once the final concepts emerged. This would have helped prevent students from reinventing the wheel for every feature of their concepts.

Product Immersion

Goal: To use and gain an understanding of various products and services that tackle diabetes management issues that are currently on the market. To learn what features are successful, useful, motivating, educating etc. and what features are not as successful.

Outcome: Each student was given a survey to fill out about their interests and activity level so that they could be matched to various nutrition and activity devices. Each student used an activity device and nutrition/food logging aid (the latter usually took the form of a website) and recorded their insights on a wikipage. They did not return to the page to discuss findings as a group.

Lessons learned: By using various products and services, the team became familiar with successful aspects and features that they could incorporate into their own designs.

Recommendations: It would have been very useful to have a discussion about what features the students found successful and unsuccessful and why. They gained insights

individually and probably implemented that knowledge in their own designs, however, sharing that knowledge could have been a powerful discussion. Discussing findings increases the chances that knowledge is shared and implemented in final design concepts and often leads to new insight that would not have been achieved individually.

Ongoing Learning

Goal: To continue to learn; to ensure that the research knowledge is useful to the designers; to validate personal knowledge gained from activities of understanding.

Outcome: Although the beginning of the project was research heavy, the team continued to learn throughout the project. The students read several articles distributed by De Polo as well as Polonsky's (2000) *Diabetes Burnout*. Activities included “Lunch and Learn” sessions during which a different member of the team would give a presentation each week. Dogs4Diabetics came and discussed the work they do training dogs to detect when a person is about to have a hypoglycemic episode. Paul Ciechanowski, MD, MPH, spoke about stress and depression in relation to diabetes, and Adaptive Path came and did a workshop.

Lessons learned: Each activity enhanced our knowledge of various topics that relate to diabetes. This is reflected in the progression of concept development. For example, the earlier concepts from naïve brainstorming heavily reflected issues of diet and fitness. Nuanced understandings of the obstacles to diet and fitness such as stress, depression, isolation spawned solutions relating to social relationships and emotional barriers.

Recommendations: The biggest issue was trying to archive the information and insights in an accessible format in order to refer to it quickly during concept generation and refinement.

Ideas and Concepts (Emphasis on Activities of Response)

In tandem with activities that focused on understanding, the students conducted activities of response. This included several types of brainstorming and concept sketching and development.

Reverse Brainstorming

Goal: To brainstorm the problems instead of the solutions, focused around specific Outcome Driven Innovation (ODI) jobs (Ulwick 2005). ODI was a technique used during data collection (which occurred before we arrived) to rank the tasks or “jobs” related to diabetes management.

Outcome: De Polo led the students in reverse brainstorming. They used the ODI top jobs as sparks for generating concepts. They took one job and brainstormed problems (obstacles to that job) for five minutes. Then they spent ten minutes coding and regrouping the problems. They wrote down the main points on sticky notes and mapped the sticky notes on a time/value grid. (The range included low to high value: How important is this problem; and transient/persistent: Is this a temporary or chronic issue?) During one session the endocrinologist participated which was beneficial because she brought a different perspective to the jobs. Her ideas were based on her medical

understanding of diabetes as well as what she had learned through patient visits including people's attitudes towards doctors, towards their illness, and what she called noncompliance. The team repeated this for several hours at a time across several days. Each session focused on a different job (e.g., managing stress, maintaining weight loss that has been achieved, etc.).

Lessons learned: Each job on its own is a vague statement. The students learned the complexity and challenges behind each job and reasons why diabetes management is difficult by discussing challenges and relating the jobs to examples from the research and immersion activities. However, information was sometimes lost by synthesizing all the problems into bullet points, and often the students returned to the original sticky notes when generating solutions.

Recommendations: It was difficult sustaining brainstorming for more than an hour or two. After a few days the students were so burned out that De Polo suggested a critique session to expel concerns out in the open for group discussion, which was emotionally helpful. It might have been useful to revisit this critique to be sure that suggestions or improvements were incorporated into following activities.

Pass Card Activity

Goal: To design a solution that solves a “high value” problem.

Outcome: Following mapping of sticky notes during reverse brainstorming, the students focused on one high value problem at a time to design solutions to that problem. They

spent one minute describing an idea on a card, then they passed the card to the next person who repeated this step. After three ideas, they moved onto a new high value problem from the map. After a few rounds, they reviewed and voted on the cards. Each person crossed out one idea and passed until one idea was left on each card. The voting was a way to test ideas with the group and to leave with the best ideas (according to the team).

Lessons learned: This activity let the students practice writing solutions instead of sketching them, and they learned that not all ideas are winners as was the case with naïve brainstorming. Unfortunately, it was unclear how the students were evaluating concepts. My worry is that the way an idea is communicated affects its evaluation. Even I, whose main task was to remain loyal to the research, felt myself being drawn towards clearer ideas, or in other activities, the better sketches.

Recommendations: This activity could have yielded different results if it was more collaborative. Instead of one person individually generating ideas, more ideas might have been produced if people discussed their ideas aloud while recording them on paper. This happened minimally as some people read the solution from the previous person on their pass card and used that idea to spark their own. It might be interesting to incorporate a visual element into the pass card so that people could choose to write or draw as they see fit.

Lateral Brainstorming

Goal: To understand features from successful products and services that could be used to manage diabetes.

Outcome: De Polo tweaked Edward de Bono's (1970) method. The team used words from the ODI jobs to brainstorm products and services that already existed which solve problems surrounding diabetes management. They then took turns describing aspects of those products and services.

Lessons learned: The students looked at products in a new light and discovered what specific features were appealing and what made certain tasks easier.

Recommendations: It was a useful exercise because it forced the students to contemplate why certain features were successful, and it was a good break from reverse brainstorming while still maintaining a tight focus on the ODI jobs. The exercise would have also made a nice creativity outlet in its original form in which the person uses truly random words to spark ideas.

Naïve Brainstorming Revisited

Goal: To ensure that no good ideas are lost.

Outcome: The team went over each sticky note from naïve brainstorming and asked themselves the following questions:

Have we already covered it?

If we haven't covered it yet, does it have potential?

Could it be added to another concept?

Is it interesting? Or problematic? Etc.

They also clustered some ideas that were similar to each other that had not yet been addressed in other brainstorming sessions that had potential.

Lessons learned: There *are* good ideas that come from naïve brainstorming which makes the filtering of ideas important. However, even after understanding research findings, there was not always group consensus on which ideas to revisit. This could be an indication that the key points from the research were not completely transparent to everyone in the group or that those points were interpreted differently.

Recommendations: The students only returned to the naïve brainstorming after several weeks. Perhaps if this step had happened earlier, the ideas would have been filtered more systematically.

Sketching Concept Boards

Goal: To take a vague written concept and flesh it out at the platform level. To communicate an idea clearly to others in the form of a sketch.

Outcome: Reverse brainstorming and concept sketching happened iteratively; it was not a linear process. Reverse brainstorming usually occurred all morning and then the afternoon would be spent in concept board sketching, during which time I would review transcripts or go back into the research.

The “winners” from the brainstorming sessions were discussed and further fleshed out by the group. They created a list of concepts to sketch out and each designer

took responsibility for the concepts of their choice on a template that included a space for description. Some people did not think it necessary to always write the description and would only do so occasionally on the sketch. It was not a problem if two designers chose to sketch the same concept since they were vague enough that the concept could take on different forms and functions. The sketches raised specific questions about the user that were given to me to try to answer.

Lessons learned: It was helpful when they documented where the concept came from because it proved that it stemmed directly from a research activity. Some people felt that the sketch was simply communicating visually what was already spelled out verbally and was therefore redundant.

Recommendations: Could individuals take more liberty with written concepts? Could there have been group sketching on one concept during which participants could discuss their ideas and capture a range of variations on one idea?

Creativity Sources and Outlets

Goal: To practice other ways of sharing and generating ideas and to keep ideas fresh and morale high. Not all inspiration can come from refined methods.

Outcome: Random creativity outlets came in many forms. They took the form of flipping through books (design process books, movie books) which seemed to be a peek into other worlds and how designers created them. Videos such as YouTube and other websites gave designers insights into similar concepts, products, and services that were being

developed. Spontaneous brainstorms occurred when a few people came together at random and let one idea spark another and another without time limits or stated goals. (This can be especially satisfying and thrilling.) It was helpful to have an impromptu recorder to capture those random ideas.

Sketching as a thought process, directly or indirectly relating to diabetes, was important as well. It was key that sketching not be limited to describing visually something that had already been captured in words. Sketching was used as a warm-up, an outlet to release tension, a tool to brainstorm ideas, a way of thinking through a concept, and a way to meditate or clear the mind (although the designers may not say so.)

The inspiration board was another creative outlet. The students clipped magazines and printed images from websites that related to the project or to individuals' goals and interests to help inspire creativity. This usually comes at the beginning of a project, however, doing it later in the game turned the activity into a morale boost more than a source of inspiration. Others said they simply got inspiration from the research itself.

Lessons learned: Not all concepts come directly from refined methods. High morale leads to better designs.

Recommendations: Keep it up.

Evaluation and Platform Selection (Emphasis on Activities of Testing)

It is valuable to test both knowledge gained and responses to that knowledge to ensure that the designs are built upon fact and informed by the research data. Activities of

testing allow the designers to discuss issues; they keep the team on the same page; and they minimize designs based on an individual's assumptions about the problems.

Activities of testing can follow understanding and response or can be interspersed throughout those activities.

Visits with John McClusky

Goal: Varied with each visit but mostly to receive feedback and motivation and to plan next steps.

Outcome: Again this varied. He led brainstorming sessions, met with individuals and groups, assessed what had happened to date, suggested ways to strengthen what was already happening as well as ways to take a new perspective on the same task. He was a huge morale boost and confidence builder and clarified many questions. Although this happened throughout the project, I describe it in the evaluation section because the students often tested the logic behind their concepts and critiqued their work with McClusky.

Lessons learned: Many. It was a great help to have someone with so much experience who was not there with the students everyday come and provide feedback. He often clarified design direction and suggested ways I could communicate research data to the designers.

Recommendations: None. Frequent, short visits seemed just right to check in, get recommendations, and move forward. Although there is an obvious benefit to working

longer and more closely with a professional with a great deal of experience since feedback can be provided immediately.

Concept Evaluation

Goal: Evaluating the students' concepts was supposed to be threefold: one evaluation based on ODI jobs, one on qualitative research criteria, and one on heuristic evaluation. Instead, the qualitative criteria was used to address pre-existing concepts (that were not developed by the interns), and the heuristic evaluation was used to evaluate devices (that were used during the immersion activities) on the wikipage. This section focuses on using the ODI job evaluation to rate the students' concepts with the goal of selecting the “winning” concepts based on the user's needs.

Outcome: ODI jobs were the evaluation criteria used to rate each of the 74 concepts that had been sketched by the students. The students, along with members of the NCI, ranked each job on a scale from 1-5. (5-extremely satisfied, 4-very satisfied, 3-satisfied, 2-somewhat satisfied, or 1-not satisfied from the “user's point of view.”) They also noted whether they thought the technology already existed, if the product was aligned with Roche and how long it would take to implement (red-5+years, blue-2-5 years, green-0-2 years.)

The aim was to complete one concept every five minutes or so. Each person presented their own concept, explaining their intentions, how the product worked, how it met diabetes management issues, what other devices it could interact with, and where the

idea came from. After individually ranking all concepts, the score sheets were tabulated. The team discussed the evaluation and tied the concepts back to research questions and insights.

Lessons learned: It was difficult to constantly wear the “user hat” to assess concepts because the students were too close to them. Also, there was some discrepancy as some people found themselves ranking what the concept could offer and others found themselves ranking the concept literally. Despite some worry about ranking accuracy and consistency, it was an extremely efficient method of filtering that many concepts.

Recommendations: Although the ODI jobs are based on research, it would have been beneficial to incorporate qualitative data and heuristic data into the evaluation criteria. Also, there is no one “user” whose needs will be satisfied by products and services. There is a spectrum of various people with diabetes who will use the products, and it is important to capture those variations during the evaluation. It could have been useful to rank concepts with various market segments, clusters, personas, or interviews in mind to add depth to and clarify what it means to rank concepts based on the user.

Add-ons

Goal: To document improvements and modifications on concepts.

Outcome: During the evaluation, people took notes on how they could improve concepts or connect them. The students returned to these notes when “winning” concepts were selected to see how they could be enhanced.

Lessons learned: Most concepts had potential and raised question marks or points for discussion so it was important to document those ideas and save them for concept combination and refinement. Although we posted these ideas to return to later, they did not directly influence final design or further research. One reason for not focusing on them more may have been that the final concepts themselves raised more pressing questions with which I could reexamine the data.

Recommendations: Would this have been more effective as a recorded group discussion rather than individual notes? Once pairs were selected for final concepts, the group could have had an in-depth discussion about various builds and combinations to ensure that no good ideas or builds were lost.

Clustering Platforms

Goal: To categorize concepts by platform and compare them. To evaluate which types of platforms were abundant, which were surprisingly sparse, and what the concepts in each cluster had in common.

Outcome: Before they received the results of the evaluation, De Polo and the students grouped concepts based on platform to get an idea of how they may be able to combine ideas. They grouped them by: mobile devices (analog/non-digital, electronic/PDA, wearable), web-based services, non-web based services, and fixtures/non-mobile electronics. (They made copies of concepts that fit into more than one category.)

Lessons learned: They began to see how concepts linked to one another. The students

learned that core ideas and the functions behind many concepts did not depend on the platform. This forced the students to have conversations about what functions *did* depend on platform and later (in pairs) to weigh pros and cons of various platforms.

Recommendations: Since the students realized that platform was not as relevant as other aspects of their concepts, it could have been interesting to cluster the concepts on other criteria beyond platform if time allowed. For example, we could have clustered similar ideas regardless of platform, or by what problem or ODI job they were trying to solve.

Concept Selection

Goal: To pull out “winning” concepts from the evaluation based on combined rankings.

Outcome: The concepts were selected based on the high scores from evaluation. The rankings were calculated two ways. One was based on the percentage of people on the team who scored each job a 2-5 (out of 5). The second calculation showed the percentage of people on the team who ranked each job as a 4 or 5 (out of 5). De Polo and the students first examined the concepts that got high scores in both sections.

They went through each high scoring concept, discussing why it ranked high and talking about its platform, its features, what it lacked, its potential and if there was another concept that was very similar to it. Three of the thirteen or so highest scoring concepts turned out to be better features or qualities than platforms and were kept to the side for later consideration.

Lessons learned: Numbers do not have to be considered hard fact, especially since the

concepts were scored subjectively by the students and not by people with diabetes. By scoring ranges of votes, the evaluation did not declare hard winners and losers.

Recommendations: The original intent was to filter concepts, not to throw them away but to return to them as desired or needed. I am not convinced this happened. Perhaps there could have been a session where the students reviewed the “losers” for potential builds? Or revisited the concepts with different evaluation criteria?

Concept Combination

Goal: For everyone to know what final concept they were going to work on for the rest of the internship.

Outcome: The students reviewed the thirteen or fourteen “winning” concepts and combined similar ones. They then presented this to De Polo, and together, they defined the platform for each cluster of concepts. They assigned the final platforms to pairs. One pair was assigned location/service, one received portable devices, and another pair was in charge of stationary electronics.

Lessons learned: Concepts were not necessarily voted on or evaluated for their platform so it felt jarring to define the concepts by their platforms after the evaluation was finished.

Recommendations: The students knew that the concepts were to be fleshed out at the platform level, yet the brainstorming was not focused on platforms, they were focused on the issues, jobs, obstacles etc. Most pairs used the concept boards from which their

platform was defined to develop their final concepts. However, there still seemed to be a disconnect between the concept evaluation and final platform selection. Perhaps there should have been a group discussion or brainstorm once final platforms were distributed to pairs.

Evaluation (Based on Qualitative Research Criteria)

Goal: Ideally, the goal should have been to reevaluate the students' concepts using qualitative research criteria. Instead, the goal was to evaluate a different set of concepts which were generated before our internship, looking for concepts that could add to the students' final designs.

Outcome: I defined criteria based on insights from the ethnographic research, Polonsky's (2000) book *Diabetes Burnout*, and the students' findings. I reviewed earlier concepts that had been designed before the internship started. Using the qualitative criteria, I compiled high scoring or relevant concepts, and distributed them to the appropriate pairs of students for consideration.

Lesson learned: It was difficult to rate concepts based on the qualitative criteria, partly because not all the concepts were fleshed out in enough detail, and partly because the criteria fit better as insights rather than obvious qualities of products and services that could be measured on the Likert scale.

Recommendations: We should find other ways to use qualitative data as an evaluation tool even if it takes the form of recommendations or guidelines based on research and not a

quantitative ranking system.

Documenting Ideas

Goal: To develop common references by documenting all ideas and activities throughout the design process so that team members can refer back to what they have done and learned, so that knowledge is not lost.

Outcome: The students kept digital files of their presentations and notes saved on a hard drive (in Word, PowerPoint, .pdf, Illustrator, InDesign) and in hard copy (as printed packets, posters, hand-sketched pages, sticky notes) in the workroom.

Lessons learned: In a perfect world, all documents and presentations would have been stored on one communal hard drive that lived in the workroom as well as printed and posted on the walls for easier access. In reality, walls are layered and cluttered and some information gets buried beneath a wall of ideas. In other cases, students needed an electronic file and could not always locate it.

Recommendations: Organize the office at the end of each day or at least at the end of each week and prioritize documents. Do we need everything accessible at all times?

Final Stages

The last couple weeks of the project were spent tying up loose ends, finishing concepts, giving presentations, and handing work off to the NCI team.

Concept Refinement

Goal: To flesh out the final concepts. To create a project book and presentation on the

final concepts.

Outcome: The pairs branched off in order to flesh out their concepts. Each pair focused on various diabetes management tasks related to their platform. The pair that was focusing on services switched to blood glucose meters. The pairs created “to do lists,” shared tasks, divided tasks to accomplish individually, and met with the larger group periodically to check in and exchange ideas.

Lessons learned: Reporting out to the group periodically was helpful because it allowed the team to exchange ideas, to help each other, and to generate more ideas.

Recommendations: None. This worked really well because the pairs had limited time and specific tasks to accomplish.

Paralleling Research Continued...

Goal: To ensure that decisions surrounding the final concepts are informed by research.

Outcome: I developed personas (based on high opportunity segments and on qualitative interview findings), compiled transcript excerpts that addressed each pair's concept, and had discussions with the pairs to help ensure that the concepts related back to the research.

Lessons learned: After a certain point in concept development, it is no longer useful to discuss broad issues from the research even if they are pertinent. My conversation with the pair working on blood glucose was very productive because they had not yet determined what platform they were designing. They had assumptions about how, when,

and why people tested their blood glucose level and were ready to learn from the interview transcripts what people were actually doing (or what people were saying they were doing). Since they had not selected a final concept, they were open to using this information to guide their designs. For other groups who had already chosen their final concept and were further along in the details of their designs, it was discouraging to hear about behaviors that could challenge their concept and might burden them with more questions and tasks than they had time to address. I got the impression they wanted to continually move forward in their design and that the research felt like a step backwards because it forced them to reevaluate something they had already finished.

Timing is key in this conversation. Too early and the researcher does not know what information is relevant to share, too late and the designers are no longer able to use the information to inform their designs.

Recommendations: It is necessary to have these kinds of conversations regarding the research when the concept is defined enough to focus the research insights and blurry enough to use the research to inform the design.

I informally coded the interviews for certain topics (blood glucose, diet, family, activity, stress, etc.), but if the interview transcripts had been coded more fully earlier, it would have been a lot easier to find pertinent bits of information. Also, had I started looking for patterns in the concepts (and not simply the research) before we evaluated them, perhaps I could have used the concept patterns as a guide to look for relevant

research data. That way I would have been better prepared to speak for the data once final concepts were selected.

Next Steps: What Still Needed to be Developed After the Internship

It was important to let the New Concept Incubator team know what we had accomplished up to this point, what questions remained, and what still needed to be done after we left so that they could continue our work.

Interfaces

A few designers raised the issue of what kinds of interfaces people would prefer. This is not something that can be answered from the interviews. In an open ended interview people will not tell the researcher directly that they learn better from graphs or would prefer an avatar, although some of this information can be inferred based on their interests or by observing the artifacts they own. The students took logical leaps of faith from the interviews when designing the interfaces to their devices. For example, people who are not motivated, have trouble getting started, or already play video games may enjoy a more playful visual interface. Others who already are highly motivated, educated, do not enjoy games, or would find an avatar too abstract might prefer numbers and graphs. There is flexibility so this should be tested with potential users.

Recommendation: It could be useful to present different devices with various interfaces to users and ask them what they learn from each device. This goes beyond asking about preference. It is essential to observe how the user interacts with the device, what the

difficulties are, what is redundant, what questions arise etc. Observing the user trying to accomplish certain tasks, followed by a discussion of what worked and what did not work could be useful. This discussion could also provide insight on how people turn data into information because they could describe what they understood from the data provided.

Goal Setting

How do people set appropriate goals (short and long term)? Some information about how people set and follow goals was revealed in the interviews, but it would be useful to take people through some tools we have been discussing such as a questionnaire or goal setting self-assessment activity to see how they respond. Of course, this would be made stronger by following subjects over time to observe how people set and follow goals using various tools.

Analog and/or Digital

Are people more successful with high or low technology solutions? Or is it better to combine high with low tech options? This kind of information may be acquired from larger demographic survey information focused on the ODI high opportunity segments and would be important to know before the products are finalized. However, this preference should align with Roche's goals for product development as well.

Reflection on Collaboration

In this next section I describe lessons learned from my work experience at Roche. I focus on the design process, the relationship of research to design, and my roles

throughout the project. I also raise questions which I will try to answer in the following two projects.

Designing *for* the User's Behavior versus Designing *to change* their Behavior

From the beginning of this project, activities were conducted with the intent of learning about the goals that people living with diabetes were trying to accomplish and about the obstacles they encountered. It was clear that the designers were to uncover and design for the user's unmet needs. But what did that really mean? Did it mean designing *for* people's behavior or designing *to change* their behavior? Part of the confusion stems from the fact that some users want to change their own behavior to improve their diabetes management and it is *that* unmet need for which the students are designing. However, there are other people who do not want to change their behavior or do not recognize a problem or obstacle. When the students design concepts to make these people change their behavior they are no longer designing for an unmet need from the user's perspective. For example, should the blood glucose meter be designed with the notion that people will test regularly? It might be a goal but it is simply not what the interviews say people are doing. The majority of people rarely test, if at all. So then does the goal become rewarding people for testing when they do test or does the design challenge become trying to make them test per the doctor's recommendation? The former takes a participatory, bottom-up perspective, and the latter a social marketing-esque, top-down perspective. Neither is wrong or right, in fact combining these methods could be powerful because the

designer could then be solving a problem from multiple perspectives, but it is misleading to say that we are designing for behaviors when we are designing to change them.

The User Is an Illusion

There is no one user nor are there universal “user unmet needs.” There is, at best, a spectrum of archetypes, segments, and clusters. In fact, it might be variation and complexity which leads to the greatest design innovations, and outliers should not be discounted. Products and services can also affect individuals who may never use them, such as family members and friends, and it is important to keep these people in mind as well. Maybe this is a semantics issue, but “the user's unmet needs” is an oversimplification of the issues raised by the research and is misleading.

Tick Tock: The Research-Design Balance

Traditional academic anthropologists typically would spend months or years studying a particular group of people. Some of the recommendations above encourage extending the learning activities and research components of the design process. However, most companies cannot afford to spend a year waiting for research results or immersing their employees in knowledge gathering activities. With this in mind, abbreviated time frames and rapid appraisal methods have proved successful in informing design. Under the circumstances, the fact that the students did not return to the wikipage or explore the research as much as an anthropologist would is understandable. However, I am not convinced that the final concepts would be as strong had the students not

completed the research activities since they contributed to understanding, raised questions, and developed a foundation of knowledge against which design hypotheses could be frequently checked and tested. In fact, I would encourage more back and forth between understanding and response since some activities emphasized one or the other and did not always lend themselves to fluid conversations. Perhaps, it would have been beneficial to reduce the number of activities and focus on a few to ensure that they tied back directly to concepts.

The Conversations

By conversations, I am referring to the back and forth between research and design activities. The research cannot possibly spell out specific solutions but it does provide clues and context in which solutions can be successful. The students reflected on the research, responded to that knowledge by sketching or brainstorming, and tested both their understanding and designs which led to increased understanding. This constant back and forth ensured that research was used to inform design rather than simply to defend it. Since the designers and I worked closely, we were able to discuss how the research related to design concepts throughout the process. As mentioned above, after a certain point, when designers are completing their concepts within a limited time frame, they may only be responsive to research that will help them defend their ideas rather than using the research to change the concept late in the project.

How to Be a Champion

Another challenge I faced was how to be the “champion of research” when I had the same access and experience with the data as the designers. I was also torn between wanting to do participant-observation of the design process and working on the project problem in an anthropological capacity. There were logistical (and cognitive) reasons why I could not conduct the design activities, document the design process, and be the champion of the research simultaneously. I found refuge in the idea that as I was doing the design activities I would ultimately fall back on my own knowledge and experience and thus embrace and complete the tasks differently than the designers, adding another dimension (and hopefully value) to the activity. I suspect that many applied anthropologists find themselves in the position of playing multiple characters and must be aware of their various roles.

How to Communicate Research to Designers

By the end of my internship at Roche, I was still struggling with the issue of the best format to communicate research ideas. It is not the designer's job to dive too far into the research. However, how can they possibly absorb the complexities of diabetes management without all the juicy details from the research? At times I felt like I was hoarding information and not always distributing it. However, I found that summaries that were too long, included too many details, or did not seem directly relevant to current activities were easily dismissed. I was uncomfortable with the personas originally, but I saw their value when the designers accepted and used them to guide their own concepts.

In the next projects, I continued to work on communicating research in ways that designers could easily understand and use. This included incorporating pictures, images, personas, interview clips, narratives and more to make the research as clear, concise, and tangible as possible.

There is No “I” in Team

Working in close quarters had some benefits and drawbacks, and various activities worked better in groups while others were more successfully accomplished by individuals. What is gained by working together and what is gained by working individually?

Togetherness: When all together, the students bounced ideas off each other and received immediate feedback. They could raise and answer questions so that everyone had a similar understanding of the problem or task at hand. (On the other hand, some lengthy debates over next steps led to more discussion than action.) Enthusiasm for work is contagious. Working in groups encourages more productivity because, frankly, it is difficult to slack off when your colleagues are slaving away right next to you. Groups can be dynamic especially during discussions, brainstorming, and concept sketching. One person gets an idea which sparks another idea which leads to another. Groups are beneficial when reviewing research findings as well as designing concepts.

Unexpectedly, there was a great deal of individual work that was accomplished in group settings. During brainstorming or concept sketching, for example, when it was

quite possible to bounce ideas off of the team, many chose to work individually. In this case, the group was there to help keep people on track and not to provide feedback.

Me time: Working alone allowed individuals to work at their own pace and to make decisions quickly because they did not have to clear every action with the entire group. Sometimes it was easier to read and write when isolated from people who were working on more boisterous activities. However, working in isolation sometimes led to miscommunication that required more time to resolve than it would have taken to discuss the issue up front.

How to Not Lose Information

One goal throughout the project was to filter ideas without throwing any “good” ideas away. A vast amount of paper and ideas were produced this summer and most of the information was stored in some form, either electronically or in hard copy. However, we should have devised a more organized retrieval system so that the ideas could have been incorporated into design activities or the concepts themselves more readily. I am not sure if this should have taken the form of a physical filing cabinet, or if we should have developed some kind of master table of contents, but I would have liked to reorganize the information and work in progress.

Deliverables: Balancing Instruction and Freedom

Letting individuals decide for themselves what tasks to accomplish and how to present ideas showed a great amount of respect for us as autonomous employees. It also

allowed us to experiment, and lessons learned are often more valuable when experienced personally. However, this kind of project was a new experience for most of us and more guidance would have comforting. At times, it was frustrating to do an activity, only to be given the deliverables later, meaning work had to be redone. On one hand, I wish we had taken more initiative and jump started more of our own brainstorming, exercises, and fun activities, however, I do think the goals and deliverables of some activities should have been clarified earlier. For example, we started product benchmarking only to discover a couple days later that we should have looked for specific criteria. This had a deflating effect on the team. Perhaps, it is the role of the anthropologist to fill this communication gap.

Great Idea Does Not Equal Great Product

Great design solutions to unmet needs are not always viable business ventures. The NCI kept insisting that they wanted to design for the needs of people. In fact, they wanted to design products that addressed unmet needs that were also profitable for the company. They also told us that not everyone could be helped and that we should not focus on the marketing segment with both poor education and low motivation. Roche's need to make a profit is understandable but frustrating when much time is spent analyzing and designing for needs that will never be met. It is upsetting to know that your goal is to only help those who are easier to help. This is when the gaps between designer, user, and client start screaming and compromises have to be made (Zeisel 2006).

Project 2: DSID 128 and Herman Miller, Inc.

My second project involved participating in the industrial design class, DSID 128: Advanced Projects, which was co-taught by John McClusky and Chuck Darrah. The class met Tuesdays and Thursdays fall semester 2008. The students had many deliverables throughout the semester, but the overarching goal was to produce a final concept, fleshed out in great detail, that could be presented to Herman Miller, Inc. To inform their concepts, they used ethnographic reports written by Darrah for HMI. Priyanka Mehan and I conducted participant-observation, had conversations with students, and took heavy notes. In order to immerse myself in the process, I attended class as if I were enrolled in it. I worked with the industrial design students in order to document the design process, understand how the students use ethnographic reports, help them understand the research, and to give feedback on their designs. I became closer with a few students who were, in a sense, key informants and helped me understand their perspectives on design.

Week 1 (August 26 and 28)

Goal: To introduce the project and anthropologists to the industrial design students, start reading reports, compiling initial observations and questions from the reports, and naïve brainstorming.

Outcome: McClusky led an in-class brainstorm and compiled a long list of patterns, behaviors, and principles that the students perceived from the reports in order to get a sense of the students' understanding of the research issues. The class provided a wide

array of issues but merely scratched the surface of the meanings and implications of those issues (which is to be expected at the beginning of a project.) The students spoke more of static attitudes or occurrences in the workplace rather than why or how something occurs in the workplace, or even how activities change over the day.

McClusky divided the class into small groups to continue brainstorming. Small groups focused on topics from the larger class brainstorm that struck them as salient. During these small group brainstorms, Mehan and I walked from group to group to facilitate discussion and raise questions. McClusky circulated as well to help the groups define their brainstorming category and to give feedback. Most groups divided their brainstorming topic into smaller more manageable categories. Some of the categories had ambiguous meanings, and even if we all understood what they meant at the time, they could be interpreted in multiple ways now. In the future they should be defined clearly to ensure a shared understanding and a consistent vocabulary.

Week 2 (September 2 and 4)

Goal: To start building a foundation of knowledge as a basis for design. To review initial concepts with Darrah; discuss questions, key findings, and issues; discuss ways to build on concepts; review expectations for sketches and “macroknowledge” presentations.

Outcome: McClusky announced that 75 sketches were due by the midterm presentation. He facilitated a brainstorm with the class around “ways” (how to do something), “materials,” and “different needs” (although I am unsure what “different needs” means

now since we did not complete the brainstorm in class.)

This brainstorm was followed by a class discussion of the students' concepts. Darrah challenged the class to clearly define the issues that they were tackling and to think about why they chose those issues. I think he was trying to make the students realize that the problems they were solving should be grounded in research. This led to a discussion of various research issues, focusing on their definitions and significance. McClusky then broke the class up into groups of four to build on concepts and try to answer: "What do you mean by _____?" (e.g., privacy, sound, concentration etc.) and "Under what conditions is this important?" This forced the students to define the issues around which they were designing.

As the groups tried to define the issues, Darrah, Mehan, and I look at the pinned-up sketches to see if they clearly communicated the concepts. If we had questions, we called up people to discuss their concepts. We noticed that many students qualified tasks or behavior as "good" or "bad" and they designed accordingly. For example, one student assumed that working late was bad, and therefore, he designed a space that prevented people from working late. Also, many sketches did not consider context, such as a surrounding space, office environment, relationships or what the space would look like with multiples of that product. Later in the week, McClusky briefly discussed storytelling, and the students worked in their "macroknowledge" groups (which focused on larger societal trends.)

Week 3 (Sept 9 and 11)

Goal: To discuss major research and design issues to consider throughout the project. (In fact, as I was rereading my notes, I was startled by the presence of the same issues we were struggling with later in Week 10.)

Outcome: There was a discussion of how students were reading the research reports and where they were having difficulties. Then McClusky and Darrah led a broad discussion about where to start and how to approach designing workplaces as well as for whom the students should be designing.

There were several big takeaways from this discussion. McClusky and Darrah emphasized, “People do not want to adapt their environment, they want it to adapt to them.” Or in other words, designs should be “automatic with manual override.” This first point created a shift in student thinking, particularly around personal “micro-environments” in the workplace. Designs should shift from the individual being able to manually adjust and control every aspect of the environment to an environment which supports the needs of the individuals within it invisibly. This necessarily raised the questions: What are people doing in the workplace? And how can design support the activities they are doing? McClusky suggested (as part of a research activity) to parse out which behaviors are “natural” and which are informed by the built environment in order to better understand the implications of design.

Other issues raised for discussion focused on broad approaches to design as well

as specific workplace design “do's” and “don't's.” McClusky explained that design is fraught with paradox and that the students should draw corner benchmarks (in the form of a matrix) to better articulate gaps and needs. He also announced that at this point in the process, the students should be examining a range of technologies that they might utilize in their designs.

Students then raised questions about what kinds of and degrees of technology to explore which led to a discussion of HMI case studies and marketing strategies.

McClusky told the students to do some research on Herman Miller, at the same time cautioning that the website exhibits past endeavors and that the students should be designing for the future. One way, he suggested, to start designing for the future is to create several different scenarios (based on research) of what *is* happening and what *could be* happening in the workplace.

Many other recommendations emerged from this discussion. McClusky and Darrah encouraged the students to consider wild ideas as well as design limitations in order to cover a range of designs. To design wild ideas students should look for inspiration and think big. To consider design limitations they should think of the fact that it is facilities managers who make furniture decisions and they see square footage in terms of dollars. To better communicate their concepts, students should design products in context. There are also behavioral issues to consider such as the idea that few people like working with his or her back to the door. Above all, students should consider for what

needs and for whom they are designing. This discussion broached many important issues, from general to specific (or macro- to microlevel), and from thinking about behavioral patterns to the business strategies of HMI, however, it may have been overwhelming for the students who were still conducting initial brainstorming.

Week 4 (September 16 and 18)

Goal: To juxtapose macro and micro views by presenting macroknowledge reports and by practicing storytelling of everyday life.

Outcome: Macroknowledge presentations focused on technology, the environment, and the economy. In my opinion, the most successful groups presented larger ideas such as new or emerging technologies and then shared examples of their current or potential uses while keeping them in the context of office design. Some of the less successful groups shared a smattering of products or statistics and drew arbitrary boundaries around different kinds of workplaces.

The second part of the week was spent in storytelling. The students used storytelling to work out the minutiae of examples of everyday life. McClusky briefly introduced storytelling and told the students that when trying to recognize and define design conflict, it is useful to flesh out the day to day lives of people and to project activities over a 24 hour period of time. This way, the designer can examine the life of a product over the length of an entire day.

The class then broke up into small groups. They were instructed to start telling the

story of their own work experiences and then to construct a second story using information from the research. Most groups only finished making a composite of their own experiences. The group with whom I sat described their experiences and probed questions from each other to flesh out specific problems such as “What would happen during your daily 10 am meeting? Who was there? What were the problem areas?” etc. The discussion centered around activities and sources of conflict.

Week 5 (September 23 and 25)

Goal: To make progress on concepts by narrowing the research areas; to go over methods in order to explore more concepts; and to go over the process book.

Outcome: A few students presented new concepts to the class, and we had a class discussion about issues from the research report. Darrah and McClusky tried to get the students to flesh out the meanings of these issues by asking questions such as: “What do people need to see in the workplace?” And “What are all the ways to hide visibility?”

Darrah developed five focus points for the class to consider: 1) Three to five person meetings 2) Six to ten person meetings 3) Flexible spaces for large gatherings 4) Individual space – Where would one go back to do work after the large meeting is over? 5) Remote presence - How does one reinforce that the remote worker is engaged and an active contributor? How much of them is present?

Later in the week McClusky went over process books. There was also a class discussion about incorporating macro trends into design; growth of a product over time;

what actually is occurring in the workplace and situations to be supported in the workplace; features of products; and how to challenge assumptions.

Week 6 (September 30 and October 2)

Goal: To make progress on concepts and shift concepts from features to platforms.

Outcome: We reviewed concepts, and Darrah again challenged how students were interpreting research issues. Later in the week, a few students presented photographs of office environments that they took during a visit to Google and Steelcase. Many images reinforced what we had been discussing throughout the semester.

Week 7 (October 7 and 9)

Goal: Ninety sketches due; students met individually with Darrah and McClusky for critique; students prepared for Bill Dowell's visit from Herman Miller, Inc.

Outcome: For the most part, students had their heads down and were vigorously working or meeting with Darrah and McClusky individually to discuss concepts in preparation for Dowell's visit. McClusky reviewed how students should present work to Dowell. They should have a two minute "elevator pitch" ready to present their concepts. He explained that the students could present one concept with spin-offs or five separate concepts. He instructed them to present a range of concepts in the event that their main concept is rejected.

I started exploring furniture websites such as TopdeQ, Levenger, Vitra, etc. so that I would be more informed when talking with students about their concepts. McClusky

and I touched base and discussed work I could be doing like reading *Designerly Ways of Knowing* (Cross 2006) or *Design Thinking* (Rowe 1987).

Week 8 (October 14 and 16)

Goal: For each student to pitch their top five concepts to Bill Dowell, complete with sketches that fully explain the concept, supporting evidence from research and stories, market matrices, etc. Midterm sketch portfolios (minimum of 76 concepts in presentable sketches) and their presentations in .pdf format were due.

Outcome: Students arrived early to set up work while McClusky circulated and gave last minute advice. Students also helped each other prepare. One student asked another: “Does this read OK [pointing to a layout of sketches]?” To one student McClusky said, “Did you figure out how this would collect data?” The student said no but suggested a solution. McClusky replied, “draw it now,” and the student scampered off to find a piece of paper and started quickly sketching. Almost all the students were in 2-3 person groups chatting about their work or joking with each other. One student checked up on the location of another student by calling him on the phone and asking if he was almost at school. (This point is important because design is so competitive, yet the students still helped each other during a stressful time in the process.)

Dowell reviewed and critiqued each student's work individually and the class clustered around to listen to feedback. His main comments to the students included: look at how ideas flow through groups; examine the transitional gaps between individual,

small, and large groups; transparency in meetings is good, so how can you make it so that you don't come and go and nobody knows? How can remnants of information be left to inform others? Can a place remember what happened? Think of Convia! Sensing technology is really important to HMI. How do you make information easily digestible? Anything with multi-use is a challenge because people won't use it in multiple ways. He tried to get students to discuss details (behavior, building codes, voltage, mechanisms etc.) He also mentioned that he did not see a lot of *people* in the students' sketches and that there was a lot of detail to include.

How did people feel about feedback? Those who received positive comments felt that Dowell's visit gave them momentum. Some were depressed that they did not receive enthusiastic feedback. In fact, McClusky noticed a lot of panicked conversations immediately following Dowell's visit during which some students were completely abandoning their path up to that point. McClusky wanted to know why this was happening. Were they only pursuing one path when they should have been pursuing two or three? How could they be better equipped to salvage good bits from concepts without completely jumping ship if unnecessary? How could they move forward if they realized the core of their concept was off target? What would be the next step?

McClusky's concerns countered an issue Nigel Cross (2006) addresses,

Designers do not always find it easy to generate a range of alternative solutions in order that they better understand a problem...Even when severe problems are encountered, a considerable effort is made to make the initial idea work, rather than stand back and adopt a fresh point of

departure [Cross 2006:36].

Between McClusky's and Cross's concerns there is a middle ground; instead of insisting on pursuing a doomed concept or completely abandoning ship because of negative feedback, the student could take another stab at the same issue in order to better understand the problem. For example, if the student had been developing a rotating desk only to hear from Dowell that people do not rotate desks, the student could retrace his steps to the core issues he was solving with the desk. Did the desk facilitate group communication? Did it help individuals share tools? Did it help an individual access personal storage otherwise hard to reach? And then the student can ask, "How many ways can this be done?" Rowe (1987:36) also observes that when designers reach an obstacle or are unhappy with their latest design move, they often backtrack to an earlier point of departure. Negative feedback challenges the designer's understanding of the problem and encourages creative thinking.

Week 9 (October 21 and 23)

Goal: Ergonomics, mechanisms, and plan B's. To make the design as real as possible and to make progress on the concepts.

Outcome: During this week, there was a transition from emphasizing concept generation to narrowing down final concepts and fleshing them out. McClusky brought in ergonomics books, discussed floor configurations, and told the students to start getting into mechanisms. McClusky and Darrah met with students individually. (I sat with

McClusky, and Mehan sat with Darrah.)

McClusky went through the students' sketches, talked about ways to improve each concept, and tied them to HMI furniture when possible. McClusky gave many technical suggestions and different design solutions. He recalled research points that should have been second nature to the students since they had been repeated by Darrah, McClusky, Dowell, Mehan, and myself throughout the semester. McClusky usually ended each meeting by asking the student what their next steps would be which helped keep their momentum going.

Week 10 (October 28 and 30)

Goal: To present a single concept with variations and one backup concept. A .pdf presentation of the concept was also due for grading.

Outcome: Students gave PowerPoint presentations of their work. There was a wide range of concepts as well as presentation styles. Overall, I noted a lack of larger context to support the concepts, which is unfortunate since they first started the project by looking at context via the research reports as well as larger economic, technological, and environmental trends. Most students focused on background: how they reached this point in their concept (their process), who they were designing for (e.g., small groups etc.), and perhaps a general description of how their design worked and looked.

Even though some students showed multiples or included a representation of a person for scale, few talked about how their designs would be used throughout the day

and why. Many acknowledged their focus on supporting group work, however, they failed to be specific by defining what kind of work was happening. There was also a lack of *things* in the presentations. Recurring issues in the designs, such as not providing foot cover, might have been more recognizable if the designers had included all the things that people have at their desks. For example, if I designed something with no foot cover and no storage and I thought about putting my coat, backpack, laptop case, gym bag, lunch etc. somewhere, I would recognize that I had problem. I also realized that it was much easier to spot weak points in a concept when they were fleshed out in detail.

Week 11 (November 4 and 6)

Goal: To continue to make progress on designs and to redesign weak spots.

Outcome: Most of the time all heads were down as the students labored over their designs. They continued to have individual meetings with McClusky. The students with whom I spoke were concerned with the feedback they had received during the last presentation and were working to remedy those issues.

Week 12 (November 13)

No notes.

Week 13 (November 18 and 20)

Goal: Details, details, details, and to start final concept presentations.

Outcome: McClusky explained what was due at the end of the semester: a trends report, a sketchbook, a final presentation during which the students would give a brief overview

and thoroughly explain three details of their design, and a final .pdf of the presentation and process book. Students gave presentations. Most had 3-D mock-ups by this point, but there were still details missing. Physical believability was an issue, and students needed to address illogical cantilevers, magical mechanisms, unexplained manufacturability, no specified materials etc. As part of the discussion following each presentation, McClusky asked the students to help each other choose which three details to focus on for the next presentation. The students were able to give meaningful feedback to their classmates from functional issues to form language continuity. In some cases, the students were surprisingly harsh on each other, asking tough questions such as, “How is this different than what already exists?”

Week 14 (November 25)

Goal: To continue final concept presentations.

Outcome: Final presentations continued, and again there were fruitful conversations regarding construction, materials, form, and functionality. I found myself critiquing how a furniture system may be used because again there was a lack of stories, people, and things surrounding the designs.

However, I often hesitated to comment because I did not want to sour a design during the middle of a final presentation when there was little that could be changed at that point. Had we been speaking in private, I would have broached those issues. I was torn because, as an anthropologist, I had many questions, but as a fellow student, I felt

camaraderie with the designers and did not want to make them look bad in front of their peers and teachers during the final presentations.

Week 15 (December 2 and 4)

Goal: To present final revised concepts and to include exploded views with all specifications including dimensions, wall thicknesses, CFM specs etc.

Outcome: Most people picked up where they left off from the previous presentation since we all remembered their progress up to that point and simply needed to understand their final decisions. Very few radical changes occurred which is to be expected during the last week of school. Some students came to me for feedback, but more students were doing frantic work to finish on their own. A lot of work was accomplished in these last couple weeks including final CAD renderings, 3-D mock-ups, posters for the Jr./Sr. Industrial Design Show (a design exhibition, separate from the class), and more.

Week 16 (December 9)

Goal: To finish the last round of final presentations.

Outcome: The last presentations were given. Overall, it seemed that when the students had doubts they pulled back, rendering their designs more conservative. Even here during the final presentation discussions, McClusky encouraged the students to be more adventurous and forward thinking.

Reflection on Collaboration

The industrial design students truly benefited from being able to receive expert

advice from both an anthropologist and an industrial designer. Throughout the semester, I saw students trying to satisfy an aspect of their design that either Darrah or McClusky called into question, and no student was able to pass through both critics effortlessly. By this I mean, it is very difficult to address the context, functional and behavioral logic, form, as well as the technical and mechanical aspects of a design. By meeting with both Darrah and McClusky, the students were able to balance research and design perspectives.

One student told me,

His [McClusky's] way of looking at the world is very different than you or Chuck. John is very specific about technical stuff, how it'll move or look and Chuck is talking about the theoretical aspect. It's like night and day, and they're complementing each other.

Overall, both perspectives keep the students thinking about a range of issues. Another student said,

I want to learn how to convince Chuck. Convincing John is fairly easy because I know how to convince him. When you talk to John you just have to have support information from the web and when you have all the engineering down, how this is gonna work, how this will hold together, that's how the concept passes. Chuck is different. I was surprised, I really didn't think about it in that way, how do you prepare for that?

That being said, I witnessed a wondrous blurring of boundaries in the kinds of feedback I heard from both McClusky and Darrah. Their comments throughout the semester did not follow clear anthropology-design divisions. I agree with the students who said that McClusky and Darrah had different perspectives, however, throughout the process they were not bound by training. I heard McClusky refer to the research numerous

times as Darrah commented on manufacturing, form, or scale. Experience and expertise in one field do not make you blind to another. By the end of the semester, I tried to focus on learning as much about which aspects of form and mechanisms (such as continuity and believability, respectively) were troubling the students so that I could approach our conversations in more informed ways. I think it is important to try and meet the students half way and not always speak from the point of view of the research.

This begs the question: Who are the researchers and who are the designers? Some students would ask me what my ideas were for the final design or what I would design given the same assignment. A few certainly asked me to critique their own as well as other students' work in private, asking “What do you think about the concepts in class overall?” On the other hand, many design students did extensive outside research on their own, including fieldwork such as interviews, observations, photographic documentation etc.

This blurring is exciting because it opens the door to more experimental collaboration. It challenges strict roles and relationships and tells me that researchers and designers should create together and not simply pass information back and forth. It allows us to reexamine traditional roles. For example, who defines the problem to solve? Cross (2006) says it is the designer's role, however, I think it should be a collaborative decision, especially given the students' difficulty interpreting the research reports. I had to ask myself what stopped me from truly collaborating with the design students. In other words,

why did I not pick up the assignment and try to design concepts with the students? Or why did more students not come speak with me about their designs?

I attribute my reluctance in making a design leap to my dual role as observer and “research expert.” How could I document the “untainted” design process if I was an active part of it? I realize that this question harks back to anthropology of the 1920s and studying the “untouched native,” and thinking that I did not influence the concepts is naïve. However, I still did not think it was my role to produce concepts. I also think that I was less likely to make that leap because of my lack of experience and confidence. Sometimes I was reluctant to harshly critique work because I was not certain the problems I saw were *the* problems to address. The students were more likely to come to myself or Mehan when they were too unsure of their product to show either Darrah or McClusky, the “real” experts. In hindsight, I wish I had dropped the critic stance and participated in a more collaborative way with one or more of the design students, so that it became *our* project. Perhaps, the students would have come to more solid conclusions about the research faster had I been working directly with them instead of witnessing their discussions and providing feedback, or worse simply questioning what conclusions they did reach.

Students had mixed responses to the research and utilized it in various ways. Students either did not know what to do with it (many); did not trust it (few); had to hear it for themselves (and thus conducted their own interviews and research); enjoyed playing

with it but could not get meaningful concepts from it; did not address it at all; only clung onto what was discussed in class; or said they really enjoyed having it; and only one person I talked to thought it was wonderful and useful in its original form. Some students said that they better understood the research points that resonated with their own experiences.

[I] tried to utilize some of the experience I've had working in an office. Tried to directly connect what I was reading about to what I've gone through. I haven't spent an enormous amount of time working at a desk in an office, but I was able to relate [to] some of the things...Using my own experience, if it didn't get me any farther in my ideas, it helped me understand the reading.

This statement is revealing for a couple reasons. One, this student had to think about his own office experience in order to interpret the research. This idea is supported by another student's comment. When asked to recall what part of the research reports were addressed in his concept, he said, "Somethings I remember [from the research] like the architecture firm needing large spaces, because I love big spaces. Things I could relate to, I really remember." Many students in class discussed the architecture firm and the need to spread out large sheets of paper at work as well as the example of the woman who worked in her car at the beach. This implies that research reports should be written in a manner that is as accessible as possible. Two, despite this student's ability to use his own experiences to interpret research, he says it did not improve his designs. This means there is still a disconnect between the reading and the concepts.

Part of the difficulty in using the research to inform designs stemmed from the

overwhelming amount of issues and information given to the students. One student mentioned,

I work much better with direction. I work much better with a direction, if somebody has a problem. It was very difficult going through the research and randomly coming up with problems.

This makes sense when thinking about how students gravitated toward more feature-based designs in the beginning. It was more tangible to focus on visibility, sound, and smell than to focus on whole systems or platforms. Interestingly, when it was time to address these feature-based issues toward the end of the semester, after the platform was determined, many students did not return to their previous sketches. One job of the anthropologist could be to ensure that concept ideas are not lost, and if they come up at a time when they cannot be handled, then the anthropologist should ensure that they are readdressed at a more appropriate time. In relation to the focus of the project, another student suggested,

More direction would have helped. More brainstorming in class potentially as far as what the problems or opportunities are. I know we did some of that and it helped a little but it still didn't feel like we were coming up with anything. It was difficult, I know a lot of other people found it difficult, to take a blanket case study and read and come up with ideas. That was very hard and most of us had never done it before and we were expected to instantly produce. That was very hard. I don't think it's abnormal for this industry to have somebody else do the research and it's dropped in your lap and you have to interpret it and run with it, but we've never done it before. We didn't know what we were doing. I don't know if we had the intuitive skills to decipher this stuff. Even though we've done some research before: in-home research, interviews, takin' pictures and analyzed and all that stuff; it was different having it handed to us and told, decipher it. Reading other peoples' issues, problems, scenarios, what they do, it was very different. I don't

know if for myself, I had enough knowledge to easily understand it. I think spending more time on that, learning more about how to read this stuff and understand it might have helped. Might have been able to produce more concepts faster, more quality, more productive and make that beginning stage more productive.

Another stated,

In the beginning I was sketching a lot, being productive, but they didn't get to the core of anything. Just a lot of wishy washy ideas. Even though I sketched a lot, it was initial demolition work. Then it was about getting into core issues.

Another obstacle to using the reports was their lack of visual information. However, I am unaware of any students taking McClusky's advice to try and sketch the furniture described in the reports and show them to Darrah for confirmation. Students mentioned their inability to visualize the furniture in the reports both at the very beginning of the semester and when I spoke with students towards the end of the semester.

The NOL, the first time I read that, I remember thinking this makes no sense to me, I don't know what this means when they say how they are not able to interact with this particular type of furniture. I don't even know what furniture you're talking about. Was it this tall [motions with hand]? As designers, we work so visually, even knowing the Resolve stuff, if the NOL study was about Resolve, then we would instantly know it, since we've seen people interact with it. I'm reading this and it put me off to the point of, I can't read this because I don't know what this stuff is. Having the visualization, visual interpretation, to go with the scenarios, and how people interact with the stuff is huge for us because we are so insanely visual.

Students utilized the reports in various ways. This may have reflected the difficulty of interpreting the reports but also the students' faith in them. Of the interviewees, one student asked me, "What if they just had a bad day when they were interviewed?", implying that what was said during the interviews was not a valid

portrayal of these people's everyday experiences or worse, that one cannot generalize or design for many people based on the reports of what a few people said. (And he raises an important issue. People do not always do what they say and cannot possibly articulate every move they make throughout the day. This is one reason anthropologists triangulate and spend extended periods of time in the field.) Another student wanted to hear what work conditions were like from the workers themselves, and many students did a great deal of their own research for the project as they have been trained to do in previous classes.

How did the students use the reports? Some students did several rounds of brainstorming around the different issues they found in the reports. Others held onto the main themes discussed in class. Many cited doing a lot of sketching of weak concepts in the beginning of the semester that reflected feature-based ideas rather than platforms or systems. Most students I spoke with felt they produced many sketches in the beginning that did not result in meaningful or useful concepts. They talked about this period of frustration as more than their average naïve brainstorming that occurs at the beginning of a project that serves the specific purpose of generating a strong flow of ideas as well as dumping out the wildest ideas to “get them out of the way.” Instead, many felt that this beginning period of concept generation for HMI was fruitless and frustrating. Despite this sentiment, most students kept sketching until an idea stuck as their final concept, whether they were happy with it or not.

I didn't necessarily take a problem and try to solve it. All the other rounds of sketching didn't necessarily get me, I wasn't building off of something from the beginning. It was completely random, then I ran into something that I could apply to something in the research.

In this case, instead of using the research to inspire concepts, the production of a great amount of “random” concepts allowed this student to connect a concept to something he read in the reports. Fortunately, this student was able to connect what he was producing to the research, however, it is not the most efficient way of guarantying that the final concepts are supported by research.

It was really not until Darrah's *top five* (3-5 person meeting, 6-10 person meeting, large meeting, transition to individual workstation, and remote worker) during Week 5 and around Dowell's visit (Week 8) that we started to see some students take a firm direction and make critical decisions more strongly supported by research. After this point, most of the students strayed from their original concepts of individual workstations and veered toward the small group meeting place (or the transition between the two.) Even then, we saw the same issues arise again and again such as exposed feet, nowhere to put all the *things* of the office, exposed backs, movable furniture systems which we know will not move, and more. When asked, “If you could start the project again, would you change anything?” One student replied,

My design really changed after realizing that people don't move things and things need to be group oriented. I wish that would've stuck sooner. I don't know necessarily if I would've gone in the same direction. But it would have helped sooner on. I was in lost concept land for awhile which is fun but I feel I'd be further along, maybe, maybe not.

However, even towards the end of the project, some students were unsure of the main research points. Some students came up to me when they were scrambling to finish, and therefore did not have a lot of time to dip back into the research themselves, and would ask me if the research supported their designs. There was no time for a long wandering conversation during which I could problematize their assumptions. Instead, I found myself quickly highlighting parts of the research that pertained to their design so that they could make rapid decisions. This, however, is not ideal because it is much easier at this point to pick and choose the research points that support one's own design rather than utilizing the research to directly inform design.

These examples imply that the research should be broken down into more tangible chunks of information in the future. Or the anthropologists should provide a brief contextual overview followed by specific charges and recommendations for the students. In other words, either we should have taught the students how to read the reports or we should have told them what problem to design for explicitly. When one student asked me how to impress Darrah, I explained about anthropology and how to design with people in mind. I said, "If you tell Chuck your design is going to create a certain social environment or provoke a type of behavior and he knows it won't, then it falls flat. Just as John knows when your construction is defying physics and engineering, Chuck knows when your design is defying social theory." This made sense to him, but how can we expect the designers to know what this social theory and history are without describing them? One

student suggested that we should have given a lecture on anthropology. This may have helped, particularly coupled with a workshop on reading the reports through an anthropological lens. In addition, I would have preferred being more concrete about what problem it was they should have been solving. Interestingly, I thought it was fairly clear that the students should focus on integrating Convia into the workplace. Instead of designing for Convia, as was recommended so frequently by Dowell, Darrah, and McClusky, only a few students addressed it as an aside that could be incorporated into the product they had already designed. Only one student confessed to me during the Jr./Sr. Industrial Design Show at the end of the semester that he felt the project lost focus. He said that at first it was about integrating technology and using Convia and then that got lost over the semester.

Another key element in the design process this semester was feedback. Students relied on feedback to move forward and many admitted having difficulty evaluating their own work. Most students relied on McClusky and Darrah to make progress on their designs. A few students said that each week was a turning point in their project because they would receive feedback in class and then quickly try to make changes in order to receive more feedback the following week. They also mentioned that when they were stuck they would simply wait until class in order to receive feedback and move forward. Others cited Dowell's feedback as playing a pivotal role in decision making and final concept selection. (Also, the preparation for Dowell's visit was cited as one of the most

productive times during the project.) They relied on Mehan and I less for reasons mentioned above. A few students also mentioned turning to their bosses and other teachers and students for advice. They relied on feedback for small and large decisions, and often they were uncertain how they reached the design they were currently developing. One student said that his final concept choice was a “fluke,” and he could not recall how he made the decision to pursue that specific concept. Another lamented seeing some of his previously rejected concepts being pursued by other students.

I saw potential [in an earlier concept] but John and Bill said it had too many moving components that people had to reconfigure every time. I see other peoples' concepts and I see something similar, I think, why didn't Bill say something. Or John sees it in other people's work and he says it's really good, and I think, why didn't he see it in my sketches? I guess it's the way they present, if they present it better.

One student told me he would get stuck:

Every Tuesday, no every Thursday. Every Wednesday night. I almost look at it as two different projects. Doing all the sketching, all the ideation seems like a different project than when I had my concept and started working on the pitch. Since I've started on this part I'd push it, work on it almost everyday, I would get stuck, frustrated, or fed up, not know what to do next, I'd wait until I'd come and talk to John. At least once a week either Tuesday or Thursday, one way or another. I'd get to that point every 5 or 6 days.

Another student said,

Each meeting, John and Chuck would give me feedback, and I'd go change it right away, then I'd have something totally different. Then I show it to them again, if it doesn't work, I change it again, that's my process.

I asked yet another student, “When did you feel like you were making the most progress?”

In response he said,

When I spoke with you. When I got confirmation from Chuck. What John was telling me to do was to make variations, show it to Chuck, show how it ties back to the research. If he confirms that it ties back to research then you're OK. And when I talked to you guys [the anthropologists?], everything was OK there. I talked to John at the next meeting, and everything was OK there. That Herman Miller guy came along, and it was OK there too.

I believe part of the reason the students relied so heavily on McClusky and Darrah for advice is because they were the experts on the topic; they were the link between themselves and the client (HMI); and they were the main evaluators (and graders) of the concepts. In response to a question about where to go for help with a project, one student said,

I've really depended on teachers for feedback, this year more than any... I wanted someone who understood the project. I didn't want to have to explain the project and then get weird feedback.

This may also have to do with the challenge of articulating the design process, briefly summarizing the designer's progress up to that point, and the issues surrounding their concept so that someone outside of the project could understand and be able to provide feedback. However, it is also important to the students that they receive meaningful, thoughtful information. One student said, "Sharing your idea with someone who really doesn't care will give you superficial feedback."

Another reason they thrive on feedback is because many of them say that they cannot trust their own critique. One student said, "you have to think about pluses and minuses to make a sound judgment. The challenge is coming up with the criteria to make

that judgment and just to be happy with it.” Another student was more severe, “[What] I’ve been fighting from the beginning is my own critique, I can’t trust it, it’s what I learned, I have to trust the process. As long as I’m doing what I need to be doing, it’ll come out.” Another student, when asked what needed improvement in his design, said, “Most of it I like before it gets shot down. Then it’s like, forget it, it’s bad.”

Yet another reason they have trouble evaluating their work could be that they are trying to satisfy too many goals and are designing for too many people. At the minimum, most students are designing for HMI, McClusky, Darrah, and their portfolio.

Part of my evaluation process has been consciously evaluating using the tools that I’ve learned... I’d like this to be a caper to my portfolio, to be my final senior project, go out with a bang.

In hindsight, it would have been beneficial to develop some kind of filtering criteria. The methods that were mentioned in class include: pro/con lists; opportunity matrices; asking yourself, “What do we need this for?”; asking “What will HMI pay for?”; and other numbered ranking systems. Perhaps, it could be the role of the anthropologist to develop a method of filtering and evaluating design concepts based on the research reports. Recommendations occurred in individual critique sessions, but it might have been useful to provide some general guidelines that the students could follow.

Fighting the Magic: Considerations

Sometimes when designers are stuck or cannot move past ideation, it is due to what I like to call the “magical beans syndrome.” Various industrial design students

spoke about design as a marriage between form and function and a third magical element described as: oomph, spark, cleverness, wit, magic, and a gem. However, if you spend too much time looking for magic, you may find that you have traded your cow for magical beans with no actual magic in sight. In other words, you may realize that time is up and you still do not have a final concept. One student told me about coming to terms with not finding that magical quality during the HMI project.

I was looking for magic. Regardless of what magic it is, it's still going to be a table. So I wanted to tell the story well... With Ray [pseudonym], I had to help him, he was trying to dig deep and find all kinds of magic and I'm like dude, you're designing a table man. Yeah, kick yourself in the ass, there's no magic. It's all in the research, that's where the magic is.

This hunt for magic can also be a threat to collaboration if it makes the designer reluctant to share ideas. One student told me, “There are some [people] in class...we don't mind sharing. We still have all the same research and all that. There is a point when we'll stop posting specific work. When you find the magic you don't want to share it.” This brings up an interesting difference between anthropology and design. Although anthropologists do thrive in studying variation, it is often considered favorable when researchers on the same project reach similar conclusions. It means there is a solid idea to pursue and a theory to test. Whereas, the design students became frustrated to find that so many of their fellow classmates were pursuing ideas similar to their own. (Many students, for example, worked on concepts for small group meetings.) They resented this commonality instead of embracing the fact that they had hit upon a key problem to solve

(which should have come as no surprise since McClusky and Darrah labeled certain issues as the key issues to focus on.)

Another aspect of design magic is the ability to take the messy design process and present it in a linear, logical fashion. The students spent a long time and a great deal of effort focusing on presenting (PowerPoint, mock-ups, and posters.) More than one student admitted to me that if they cannot draw something well, they will skip that concept idea and move onto something else that can be communicated better or will look better in a sketch. Another student told me that CAD, or Computer-Aided Design, can limit the designs they make. At times, the functionality of a design or its connection to the research is put aside to focus on the aesthetics. Then once the design is complete, they will patch together the bits of research that make their design necessary and relevant in the future workplace. This reinforces in my mind the need for dual consultants - anthropologists and designers who can balance conflicting perspectives and ensure that the final design is still strongly supported by research.

Another factor, that put a great deal of pressure on the students, was the fact that the students were not solely designing for the class or for HMI. They were designing for HMI, McClusky, Darrah, their grade, their portfolio review, and for future employers. One student told me, “The whole, having to put in your portfolio, you want to be hyped and excited to talk about it. Yeah, I designed this chair, and that’s about it...I can draw [laughs].” And another said,

I want to show off for my final review, hopefully I'm done in December. I want to show off to them, this is what I've learned and I'm utilizing the tools I've picked up here. Part of my evaluation process has been consciously evaluating using the tools that I've learned. I'd like this to be a caper to my portfolio, to be my final senior project, go out with a bang.

I even put pressure on myself to really help the students that approached me. I remember one day Mehan criticized a concept made by a student whom I had been helping, and I was extremely defensive of the work and started defending a concept that I did not create nor that really justified defending. Throughout the semester I had been criticizing students for falling in love with their designs and for being too emotionally attached, but at least they were attached to their own designs! It is easy to get swept up in design magic. At that point I realized there should be some distance between the researcher and the design or at least a second researcher that can be brought in to ground the concept in reality (as Mehan did in this case).

Project 3: HEAL Design Research and Charrette

My third project falls under the Healthy Eating Active Living (HEAL) Grant which was made by Kaiser Permanente to the Nutrition Science and Anthropology departments and comprises many different projects and objectives. Overall, the healthy campus initiative aimed to address the problem of increasing prevalence of overweight and obese San José State University community members (students, faculty, and staff). Specifically, the HEAL team was to conduct research projects that ultimately informed interventions or changes in the built environment that support health and wellness on

campus. Documenting the entire HEAL project does not fall within the scope of this report, however, I will describe components of HEAL research to provide background for my discussion of design research and the charrette.

Since fall 2007, the Anthropology HEAL team (consisting of Chuck Darrah, P.I., Matthew Boehm, Nicole Conand, Marina Corrales, Priyanka Mehan, Joseph Monzel, Cara Oba, and myself) has worked with Nutrition Science on this project. The initial role for the anthropologists was to conduct evaluation and to support Nutrition Science projects. Since then, we have conducted our own research to inform changes in the built environment. The following is a brief summary of anthropology research activities.

Freshmen Focus Groups (spring 2008)

Goal: The focus groups were designed to supplement a freshman survey that had already been conducted by Nutrition Science. The purpose of the focus groups was to understand the “how” and “why” behind activities related to nutrition and health and to understand what drives the choices students make regarding nutrition. “Validation” of the freshman survey was also a consideration when designing the focus groups.

Outcome: The focus groups were a collaborative effort, designed and facilitated by Leah Haritan, Nutrition Science master's student, and myself. All groups included male and female participants, students of various ethnicities, and various majors. Although, this is not a representative sample of the larger freshman population. Participants were self-selected to participate in the focus groups. A call for participation went out to 600 first

time freshmen who had already completed the Nutrition Science survey online. They were divided by availability and living situation (off versus on campus). We separated them by living situation because we thought that home environment would be one of the strongest determinants of health, nutrition, and eating habits.

The questions we asked during the first session did not elicit rich conversations between students. This resulted in a deviation from the original list of questions. This had the effect of creating 8 one-on-one interviews instead of a dynamic focus group discussion. We altered the introductions for the second and third groups to incorporate general background information and interests. This was successful in creating a more comfortable atmosphere since students knew more about each other, and it opened the door for the students to speak generally about their lives without limiting the conversation to what they eat. With each focus group experience, the facilitators became more comfortable and accustomed to facilitating discussion.

We tried to “validate” the freshman survey by weighing the students, asking them to fill out a brief survey that incorporated questions from the online survey (so that we could compare this data to their previous responses), and asking them to go over the freshman survey, pointing out any areas that were unclear.

Lessons learned: I am not convinced that the focus group is the best method for collecting data from first time freshman students. It was difficult to set the stage for a conversation between the students. It is unclear whether the questions were poorly framed, the

facilitators were unsuccessful, the students were not enthusiastic about the subject matter, or the students were unaccustomed to sharing their ideas with a small group of strangers. I am certainly unconvinced that the focus group was an appropriate setting for validation of the larger survey since this did not tell the researcher whether the students understood the questions or “accurately” reported, rather it indicated that they reported consistent answers. The focus groups could be used, however, to inform later projects such as the freshman interviews. They gave the researchers a skeleton of how nutrition fit into freshman lives and a foundation for further inquiry.

Freshmen Interviews (fall 2008 – spring 2009)

Goal: To understand the daily lives of freshman students on the SJSU campus and to provide context for design interventions.

Outcome: The HEAL team conducted semistructured and open ended interviews with nine first time freshman students, six times each over the academic year (three fall 2008; three spring 2009). Although the participants did not constitute a representative sample, the students were mixed in terms of major, housing situation, gender, and ethnicity. To recruit students, members of the HEAL team made announcements about the opportunity to participate in six MUSE classes. The interviews focused on their daily activities, educational goals, obligations, places they frequent on and off campus, high school to college life transition, relationships/friendships/family, ties to the campus, health issues etc.

Methodologically, the team took a departure from traditional ethnographic transcription and analysis. Instead of transcribing, each team member summarized the main points of their interviews in the interest of saving time and money. The summaries also included reflection, quotes, and remaining questions to provide more details, rationale behind their insights, and potential questions to ask in subsequent interviews. The logic behind this was that full transcription is unnecessary to inform design. Not every team member needed to sift through all the “ums” and “ers” of a conversation in order to understand the interviewee's point of view. Although each team member handled the interview summaries slightly differently (some more tightly bound to transcription and flow of conversation than others), the data were comparable and were useful in subsequent stages of the project.

Student and Faculty Interviews (fall 2008)

Goal: To provide insight into obstacles, issues, and decision-making that happen on campus and how these relate to daily life and future goals. To inform design interventions on campus.

Outcome: The ANTH 149 Ethnographic Methods class conducted semistructured interviews with students and faculty fall semester 2008. Interviews focused on their everyday lives with specific focus on health and wellness. Interviews included a mapping exercise in which the interviewee plotted daily activities on a campus map. ANTH 149 interviewers were responsible for finding one faculty member and one student each to

interview from a specific department on campus, which ensured that the interviewees, although not a representative sample, covered a range of fields.

Staff Interviews (spring 2008)

Goal: To understand variations in experiences on campus as a work environment and how it relates to notions of health and wellness.

Outcome: HEAL team members conducted semistructured interviews with ten staff members. Interviewees were selected by snowball sampling. The researchers summarized main points of the interviews.

“Hot Spot” Observations and Photography (fall 2008 – spring 2009)

Goal: To understand how the campus is used; to document the current setting; and to identify opportunities for design.

Outcome: Observations and photographs of locations on campus were conducted by ANTH 149 and members of the HEAL team. The locations were chosen based on where people congregate, interact, and pass through as described in the student, faculty, and staff interviews.

Charrette Preparation and Execution (summer 2008 – spring 2009)

Lennertz and Lutzenhiser (2006) define charrette as a multiple day collaborative design and planning workshop held on-site which is inclusive of all affected stakeholders. It is a holistic planning process that focuses on feasible solutions. It is usually part of a three step process that follows as such: research, charrette, and implementation of design

changes. This process usually includes a series of feedback loops to ensure input from multiple stakeholders.

There is no better way to learn about using research to inform design than to conduct research, present it to designers, and facilitate concept generation around the research. My first two projects (see above) helped shape my approach and thinking around anthropology-design collaborations, however, the charrette is the first time I participated in the process from the research design to data collection to analysis to organizing the design activity. Although all three projects linked research and design, the charrette added a different social dynamic to the design process. By assembling heterogeneous teams of students, and including the researchers on the teams, we set up the potential for the back and forth conversations between research and design to occur during concept generation. This was in addition to the research materials we specifically packaged to be used during charrette brainstorming.

Within the objectives of HEAL, the charrette was an effective way of generating hundreds of concepts based on research to improve the SJSU campus. It also had the intended effect of empowering the students who participated since they generated concepts to improve the school they attend and may actually see their ideas realized. This charrette also gave the school the capability to design in the future. When changes on campus need to be made, they can return to this method to collect ideas as well as to use the actual information and ideas from our work. In effect, the teams themselves became a

model for how the campus should change in ways to encourage interdisciplinary collaborations.

There were several goals for the charrette including: to produce concepts based on research; to produce as many design concepts as possible for the future of San José State with the intention of making SJSU a “healthy campus,” or an environment that supports wellness; and to design a model of collaboration that includes Anthropology, Industrial Design, Urban and Regional Planning, and Health Science.

When and Where

The charrette was an all day workshop that involved six groups each consisting of an anthropology, industrial design, health science, and urban and regional planning student. It occurred on the SJSU campus in Clark 225 on April 10, 2009. The team decided it would be best to conduct the charrette after spring break so that there would be ample time to conduct research and prepare for the event. It was also far enough ahead of finals that students would not be completely overwhelmed by their workload.

Clark 225 was selected because the classroom setting is a common work environment for students, and it was already equipped with long tables and chairs to facilitate teamwork, sketching, and the use of larger materials. Materials included posters (depicting idealized days, typical days, campus projects, charrette rules, a description of research activities, nutrition data etc.), pens, dry erase markers, sharpies, post-its, poster paper (for top ideas), foam core palettes, cameras to document activities, and food.

Charrette Preparation

Originally, the plan was to translate the research data into a play book that would include design narratives, or stories based on research, which the participating students could use to prepare for the charrette. The play book would be shaped by data from HEAL research such as freshmen interviews; student, faculty, and staff interviews; hot spot mapping and observations; nutrition science research results, etc. Since the original charrette design, the team decided to eliminate the play book and instead to focus on designing other tools such as “typical day typologies” (see below) that were used throughout the day of the charrette to generate design concepts. The logic behind this decision was that the play book might overwhelm the participants with research, and we would rather present them with enough information during the workshop to generate ideas based on research.

A corollary to translating data into concept generators were the meetings with stakeholders. Starting in fall 2008, Darrah, with members of the HEAL team, met with faculty from Urban and Regional Planning, Health Science, and Industrial Design. These meetings served the purpose of describing the opportunity for students to participate in the charrette; confirming a willingness to participate; brainstorming possible agenda items and methods of designing as well as ways to select and involve students. There have also been meetings with various stakeholders such as Martin Castillo from Housing, Roger Elrod and Laurie Morgan from the Health Center, and Eloise Stiglitz, Associate

Vice President for Student Services. These stakeholders informed the team of major issues on campus and about projects concerning the built environment that were being planned for the future. It also gave me perspective on how things get done on campus which is essential when designing concepts that we hope will be implemented on campus. Their perspectives helped frame the brainstorming activities during the charrette. Also, by listening to stakeholders before design activities occur and using that information to shape activities, the output is more likely to be interesting or relevant in the eyes of decision makers on campus. The meetings also served the purpose of creating good faith between the business and the academic sides of the school.

Before the charrette occurred, the team held a series of research analysis sessions and informal workshops in order to plan the charrette. Activities included reading through the data and taking notes; looking for patterns, issues, obstacles; understanding the patterns that emerged from the research; discussing how to apply the research to design concepts; and how to frame brainstorming sessions with particular tools like storytelling etc.

The Pre-Pre-Charrette Workshop occurred on 2/11/09 at 12:00 pm in Clark 269. Priyanka Mehan and Joseph Monzel were responsible for analyzing the ANTH 149 hot spot observations and ANTH 149 faculty interviews; Marina Corrales and Nicole Conand read the focus groups, freshmen, and staff interviews; Matt Boehm was responsible for the 149 domain analyses; and I read the ANTH 149 student interviews. The team looked

for SWOT (strengths, weaknesses, opportunities, threats) with the goal of sharing with the group: “what we think we know” and why, what we don't know, and remaining questions. This level of understanding was necessary in order to have the subsequent workshop to structure the charrette with John McClusky.

The team (Chuck Darrah and the seven students) held a Pre-Charrette Workshop with John McClusky on Friday, February 20 from 9 am – 1 pm to prepare the agenda for the charrette using knowledge about the research. Darrah suggested that the team ask themselves: What is the goal of the charrette? Then to work backwards from there to set the agenda. The most important question to settle was: How can we translate research data into actionable information useful to designers?

The team explored different formats to translate the data including: stories or narratives about student days; storyboards, or combinations of words and images to make a narrative about life on campus; mapping pedestrian traffic patterns; speaking from the perspective of a place and detailing who comes to a place and what they do there; personas, or a description of one person's day made from a composite of people and facts from the research; typical days, or descriptions of activities on campus throughout the day that do not only revolve around a single individual; and typical day typologies with images, quotes, and maps included.

It was evident that McClusky and Darrah thought that the typical day typologies would be the best medium to elicit myriad design concepts. This method was superior to

personas or narratives because it did not focus on an individual or small group of individuals. Instead, typical days could capture activities performed by a range of students, faculty, and staff. This method also allowed for the incorporation of textual description, quotes, maps, and photographs that provided context for activities. The combination of verbal and visual description was important as it appealed to all students participating. This workshop also made it apparent that the team needed to dip back into the research because the information collected from the first pass of analysis was too superficial to create complete typical day posters. Corrales was given the task of organizing the team to analyze the data, and from that workshop until the day before the charrette the HEAL team helped each other go through the research and construct the typical day posters.

A potential drawback of the typical day posters was that it bounded the design concepts to current conditions on campus. It did not fully support the link from research about current everyday life to concepts that could be successful in the future. Darrah gave Conand and Boehm the task of combing the research in order to create “idealized days.” They in turn looked to extrapolate dreams, wishes, and hopes that could represent an idealized day from the research data. By presenting the charrette teams with idealized days, they were less tied to specific problems that occur today. They could sketch designs that may be impracticable today but may work twenty years from now. Or they may draw infeasible ideas that will never work but capture the essence of a solution that might.

After the workshop with McClusky, the team fleshed out the charrette agenda. This resulted in making the time line for the day tighter. They included an activity on the agenda that tied design concepts to current construction projects on campus such as the Health Center, Sports Club, and Student Union which they learned about during their meetings with stakeholders. The flow of design activities during the charrette made it possible to end with this activity. The day acted as a funnel, starting with broad, wild ideas based on idealized days, shifting to more tangible concepts based on typical days, and ending with specific projects on today's campus.

Another part of preparation included meeting with the participating students to go over the agenda, answer questions, fill out paperwork and explain consent. It was important for the students to feel comfortable in their roles and for us to explain our expectations of them and why they were selected. Each student that participated received a \$100 honorarium and will receive a book complete with ideas produced during the charrette and a description of what occurred and why for their portfolios.

The Day of the Charrette

The HEAL team started preparing Clark 225 (putting up the posters, rearranging the tables, setting up work stations, etc.) before 8 am, and the charrette participants started arriving at 8:15 am. Darrah began the charrette at 9 am by introducing the facilitators/organizers and summarizing the agenda and rules. He then introduced the Idealized Day activity and for the next hour the teams generated concepts in the form of

policies, services, spaces, and products based on the Idealized Day poster. McClusky, Darrah, and I circulated to observe and facilitate. Periodically, Darrah asked the students to evaluate their progress and to work on lacking areas. After this brainstorming session was over, the students picked their top three policies, services, spaces, and products to present to the group. Those were photographed and posted on the wall along with all the other ideas from the brainstorm. This would be the beginning of the New Concept Library, where all the ideas from the day would eventually end up.

At 11 am, Darrah introduced the Typical Day activity. Each team was assigned two Typical Day posters from which they generated ideas for policies, services, spaces, and products. The posters were composites of activities and obstacles (both on and off campus) gathered from research data. The teams were instructed to use pieces of the posters to generate ideas and not to try to understand the whole day since they were so densely packed with information. After about an hour of idea generation, the teams selected their top three ideas from each category and presented only their best idea to the group. The participants left for lunch after 12:30 pm.

At 1:30 pm, the teams reassembled and were introduced to projects currently happening on campus such as the new Student Union, Dining Facilities, Health Building, Sports Center Annex to the Event Center etc. The teams were to map ideas onto these specific projects and recommend principles that should be considered during the proposal and construction of projects on campus. Groups shared their lists of recommendations

and principles. The groups were then instructed to discuss what concepts could be implemented on campus next week. This showed what students thought could be done quickly on campus and also what ideas they wanted to push forward. All these ideas were captured in the form of post-its as were all the ideas generated throughout the day. The charrette ended at 3:30 with thank you's and a discussion of next steps. The groups decided they wanted to keep in contact with HEAL via a blog.

Reflection on Collaboration

These lessons from the charrette come from my own reflection as well as discussions I have had with members of the HEAL team after the event. Several aspects of the charrette surprised me. First, I really enjoyed generating the Typical Day posters from going through the research to determining the number of posters, but mostly I enjoyed the act of selecting quotes, maps, and photographs that all related and contributed to a coherent, albeit very dense, day. Each representation allowed me to look at various situations on campus in a different way. The photographs, images, and quotes put faces on the activities. Photographs and images made the posters visually appealing and exciting to use. Images led to interpretations that words could not easily capture such as facial expressions, emotive colors and shapes, and environmental context; they allowed me to layer meaning in one snapshot. Photographs captured campus context such as architecture, uses, people etc. Maps allowed the participants to look at the bigger picture as they facilitated discussion around surrounding areas, circulation patterns, transit routes,

the flow between gathering spaces etc.

Going through the research with the goal of extrapolating activities made me focus on the data differently than I would have if I were looking for general themes, patterns, and domains. Looking at the data from the perspective of activities allowed the HEAL team to identify commonalities between students, faculty, and staff that might not have been apparent otherwise. Reading the data for activities is arguably more relevant to campus design than other possible categorical breakdowns like age, year in school, living situation, race, gender, occupation etc. because it looks at what people are doing or trying to do regardless of who they are.

Overall, I think the posters were successful in that I heard students talking about them in their groups and there were hundreds of concepts generated by the end of brainstorming. How connected the concepts were to the research is still to be determined, but I am not worried about this since concepts can be strengthened through further refinement. The Idealized Day concepts were more tied to the campus than I wanted them to be, but ultimately they worked since the students were able to understand and use the Idealized Day posters to produce concepts. Darrah commented that that most likely occurred because the quotes that were used on the posters to illustrate the main points were in first person. Plus, I suspect it is easier to design around the familiar rather than creating a whole new environment or system. I thought that it would be easier for the students to use the Typical Day posters, but they did not seem to use the posters as much

as I would have liked. In our debriefing, the HEAL team thought that perhaps two Typical Days per group were too many. If they had one poster then they could have concentrated on a smaller amount of issues and put up their post-its right next to the poster which might have made it easier for them to link their ideas to the research.

Of the concepts that were produced during the charrette, I was struck by two issues. One is that concepts which revolved around a common theme or solved the same problem (e.g., find parking easier, have more green spaces, etc.) were sometimes split in terms of ultimate goal and motivation. Students seemed to either change the system or work toward exactly what the Typical Day said. For example, one of the aspects of the Idealized Day was “You find parking easily.” The resulting concepts were split into completely eliminating parking to encourage “eco-friendly” travel and making more parking structures and spaces that were easier to locate. What led to such a division? What other factors or information were involved here? At least in this example, it seems that one person designed with the natural environment in mind and were perhaps designing for some kind of common future good. In the other concept, the person eliminated today's problem directly as stated in the Idealized Day. Perhaps we needed to bring in other kinds of information besides interview data such as larger trends of the economy, environment, politics, technology etc. This may have helped prevent people from solving today's specific problems.

The second issue that struck me was the common theme of “tearing down silos.”

Many concepts involved increasing social gatherings, community building, and encouraging cross-disciplinary activities on campus. This could be a result of the information on the posters or the fact that during our preparation meetings we touted the importance of the interdisciplinary nature of the charrette. Or perhaps, the students thought that it was really important to have a more open campus in terms of collaboration and learning which may also be one reason they participated in the charrette.

Considering these issues, how did the charrette facilitate design for public space with multiple users? As mentioned above, analyzing the research in terms of activities helped shift the focus from individuals to the built environment and the services, policies, spaces, and products in it. The next time I create something like Typical Day posters, I would like to frame it in an even more social way. Even though they were composite activities from multiple interviews, they still reflected an individual mindset. This is perhaps why “you find parking easily” was a part of the Idealized Day and elicited concepts around parking spaces for every individual. If that was shifted to “everyone commutes in a happy, safe, and efficient manner” the resulting concepts might have been completely different and more forward thinking. However, this means that we would be taking a greater leap from the research data before design even happens, and I worry we would lose too much data that way.

The social dynamic during the charrette also contributed to the design of public space since design concepts were based on multiple points of view, and it exemplified

interactions I had been reaching for in my first two projects. The conversations sparked ideas as much as the posters did. Talking about issues triggered new ideas and possibly revealed biases held by the participants. The charrette really acted as a model for ways that the university can change to encourage more cross-disciplinary learning and social activities on campus.

Lessons Learned Across Three Projects

Working with designers unfamiliar with anthropological methodology has helped me strengthen my own understanding of anthropology. Because I had to describe my ideas and know why they might benefit design, I had to reflect on the merits of anthropology and its usefulness to designers. Since anthropology looks at everyday life, observes what people say and do, and tries to understand people's perspectives in a larger social context, it can guide design so that it has a higher chance of improving situations from multiple perspectives. Anthropology also gave me the tools to study the design process in depth. Participant-observation and interviewing techniques helped me learn how the designers view the design process and how they understand research. This gave me ideas about how to better communicate research to them in the future. In addition to gaining knowledge about anthropology and design individually, I have learned a great deal about collaborating with designers.

One of the biggest lessons I have learned since starting my master's project is that students do not need to have read every single interview transcript in order to produce

meaningful ideas grounded in research. Reading over my notes from Roche, I realize how unsettling this idea was to me a year ago. My problem was that I was trying to envision a complete transfer of knowledge. How could I take my knowledge of culture, ethnographic methods, anthropological theory and my experience through which I view research and transmit that information to the designers? At Roche, the idea that this could not occur was truly startling. In DSID 128, my shock turned into disappointment when I realized the designers did not want all that knowledge. I realize now that this notion of complete transfer of knowledge is not only unrealistic but also unnecessary. If the designers saw the research as I did, then they would not be concentrating on the part of the design process that makes them designers. Not to mention that they would no longer need my services! Instead, it is my responsibility to ensure that the main research ideas are understood, and by participating in the project with the designers, I can be the voice of the research throughout the design process.

Being the voice of the research in the projects meant that I had to find a way to represent the people studied. In each project, the nature of the “user” changed depending on the research and the goals of the project. Rereading my notes from Roche, I can feel my discontent with the term “user.” Especially since it was used to describe a certain marketing segment. In DSID 128 the user was more vague, and throughout the semester we emphasized the importance of designing for groups rather than individuals which helped deter people from relying on users for inspiration. During the charrette, the users

were blurred by their activities, and I think it was easy for the participants to accept the absence of users since they were in fact part of the population that would be using the new designs.

Another important point related to presenting research is the evolution of communication or translation methods. At Roche, presenting the data came in the form of quotes, conversations with the designers, and personas which were composite individuals based on marketing segments and information from the ethnographic research. The designers also used storyboards later in the process to put their concepts in context that related to the research. In DSID 128, there was a great deal of storytelling. We did some storytelling at the beginning by inventing characters and using the research to describe a typical workday. However, the bulk of the storytelling came in the description of the process, both the design students' process books and presentations that incorporated research as well as my analysis of their process. Helping the students tell stories around their concepts was a large part of data representation in that class. Finally, the HEAL charrette took a more comprehensive approach to data representation for it presented what a student, faculty, and staff idealized day and typical day might look like based on the research. It also shifted the bulk of data presentation from written documents to a melange of description, quotes, maps, sketches, and photographs on posters. Information was also produced in the groups themselves, and it was their conversations as much as the posters that propelled concept generation.

Not only did the presentation of research shift over projects, but the way we documented the design process and resulting concepts changed as well. During the Roche and DSID 128 projects, it was primarily up to individual students to organize and keep track of design concepts over months of time. Then when the project was ending, the students would put together their process books in a clear and lineal way. I constantly had the feeling that we were missing connections or losing ideas, but I could not figure out how to organize and log hundreds of ideas as they were produced. During the charrette, we had the concepts organized throughout the day. They were organized by design activity (Idealized Day, Typical Days, Mapping onto Today's Campus, Campus Next Week, and Design Principles), by platform (policies, services, spaces, and products), and by voting (each group picked their top three ideas from each category.) These were all divided, photographed, and scanned which made it easier to organize and keep track of ideas.

Tracking ideas helps ensure that we do not lose concepts that could benefit the final design. Also, by understanding how ideas evolve, we might be able to better predict which ideas become final concepts and why. This would help us organize design activities as well as evaluation methods. Throughout these three projects, I was never completely comfortable with the evaluation process. At Roche, I was so insistent that we should be able to evaluate concepts based on what the ethnographic reports were telling us that I forced qualitative research data into a quantitative evaluation format which ultimately did

not help us evaluate concepts. In both the Roche and DSID 128 projects, I struggled with evaluation because I was troubled by the disconnect between concepts and research. One of my problems was searching for evidence of the research in the concepts. However, if the concepts are a logical leap of faith from the research, there will not necessarily always be a direct link between the concept and the research.

In the DSID 128 process, there was more focus on thinking through the implications of design concepts which helped alleviate my concerns of evaluating all concepts based on a rigid ranking system. For example, if a student brought me a design, we would talk through the social interactions that might be encouraged and discouraged by their design. I also realized that if the students are designing for the future based on current data, there are larger issues to consider than the ethnographic research alone can encompass. Meaning, that just because there is not a direct line from the research to the concepts does not mean that they will fail. Had I had more time in DSID 128, I would have tried to take some of the concepts that the students developed, incorporate them into stories based on research to see if they fit into various research contexts, and work through potential implications of the design. Perhaps, I can use this evaluation method with the concepts that came out of the charrette.

In all three projects, I had to be the voice of research. However, there were many other roles played, and those roles shifted over the projects. At Roche, I shifted back and forth from participant-observer, where I participated in the design activities, generated

concepts, and documented the process, to the role of “champion of the research” where I interpreted and presented research findings to the group. In DSID 128, I took more of a consultant role in which I had discussions with the designers to try to answer their questions about the research. In HEAL, I helped to conduct, summarize, analyze, and present the research, as well as facilitate concept generation the day of the charrette. In subsequent projects, I would like to continue to conduct research that describes what is happening and what could be happening socially, to edit and develop methods that present information to designers, and more importantly, to collaborate with designers and to contribute to the ideas that inform design interventions.

Not only did my role change between projects, but the roles of the designers and other participants shifted and blurred over time as well resulting in different kinds of collaborations. In the Roche project, the design students were the majority, and they often worked in groups or individually on design problems. They fell back on their training and went through the design process more or less as they had learned in school. There were other participants in the process with backgrounds in anthropology, endocrinology, engineering, marketing etc. which exposed the designers to different perspectives, but for the most part, they followed a design process consistent with their education. Although DSID 128 followed a schedule with specific design deliverables throughout the semester, the course was co-taught by McClusky and Darrah, an industrial designer and anthropologist respectively. By having Darrah (and Mehan and I) in the course, the

students were forced to confront social issues throughout the design process. Then when I noticed Darrah and McClusky both asking research and design questions, I realized that I did not always have to speak as the anthropologist in the project. The designers could address social issues and the anthropologists could focus on aesthetics and engineering, and by having conversations with each other, we might end up with interesting designs. I think the HEAL charrette was the most challenging collaboration for the participants. The students were chosen for their expertise but were asked to not be a spokesperson for their field, meaning they should be open and flexible while designing. Instead of following the traditional methodology from their fields, they were asked to participate in our activities and brainstorm with the information they learned that day. Although the industrial design students tended to be surrounded by the most post-its, boundaries definitely blurred and students played various roles within their groups.

There is no reason there has to be a gap between design and research activities. Since design is iterative and research can take many forms, research can be an integral part of the design process. Research can frame design activities, and design can frame research activities. Design thinking can occur during the beginning research stages, and research insights can emerge from the design process. The implications of this kind of collaboration are many. Not only could it change the way research and design are conducted, but it also changes the expectations of design projects and the people involved in them. It implies that both designer and researcher should be involved in a project from

beginning to end. We are witnessing a shift from a linear model in which research is conducted and then handed to the designer to a collaborative model in which we learn and create simultaneously.

Applications in Future Projects

In the future, I can take what I have learned from these three projects and provide the link between research and design. I have learned about design processes, how anthropologists can work with designers, and when and what kinds of information can be beneficial to designers. I can be a member of a collaborative team that uses various methods to create design based on research.

If I worked with a team of anthropologists and designers, we could offer a package of services including research, design, and implementation in which anthropologists and designers were working with each other throughout the process as well as with stakeholders. Our services could include the entire research-design package or even shorter analyses or workshops. I could work on a slice of this process since I have experience working with designers during initial brainstorming, ideation, concept sketching, evaluation, concept refinement, pitching concepts, as well as documenting the entire process throughout, looking for gaps in knowledge and ways of communicating.

There are implications for companies who might hire such a collaborative team. They should no longer expect discrete informational and design elements, rather they can expect a holistic package of understanding, potential solutions, and implications. By

paying for the anthropologist to be involved throughout the design process, they are acknowledging that knowledge evolves and that we continue to learn as concepts are generated. In turn, they receive a more nuanced understanding of the problem, and it is more likely that each decision made during the design process will be influenced by aspects of the research. By paying the designer to be engaged in the research, they are increasing the chances that the research will be meaningful to the designer and that the subsequent designs will be grounded in research. They are also starting concept generation earlier than they would if they had to wait for research to be conducted first. Overall, research and design partnerships come in numerous forms and can be tailored to many different kinds of projects.

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Glossary

brainstorm	A group exercise designed to generate a large number of ideas to solve a problem. Rules usually include: focus on quantity, there are no bad ideas, encourage unusual ideas, combine ideas etc. Naïve brainstorming occurs at the beginning of a project when little is known about the problem.
CAD	Computer-Aided Design. CAD programs help designers render their concepts digitally.
CFM	Color, finish, materials. Usually decided during the later stages of a design project.
charrette	Typically a multiple day collaborative design and planning workshop held on-site which is inclusive of all affected stakeholders. It is a holistic planning process that focuses on feasible solutions. It is usually part of a three step process that follows as such: research, charrette, and implementation of design changes. This process usually includes a series of feedback loops to ensure input and buy-in from multiple stakeholders.
concept	An abstract idea that may be pitched as a potential solution to a design problem. Concepts can be vague or very detailed and refined. They exist as words, sketches, mock-ups, CAD models or some other form.
concept build	Taking an existing concept and revising it by adding to it, eliminating features, combining it with other features etc.
Convia, Inc.	Is a subsidiary of Herman Miller, Inc. Convia is a modular, programmable electrical and data infrastructure that delivers power, without requiring the hardwiring of devices or switches.
deliverables	Products that are due at certain points during a project. It might be a concept or object that is created and delivered throughout or at the end of a project or more abstract goals that should be met by certain dates.
design	Both the process of creating something new, or developing a plan, as well as the plan or final outcome itself.
feature	Refers to an aspect or detail of the overall design. While it usually does not inform its main functions or platform, it can be a particular part of a

	service or product capability. For example, redial is a time-saving feature on most cell phones.
HEAL	Healthy Eating Active Living grant made by Kaiser Permanente.
HMI	Herman Miller, Inc.
ideation	The process of generating and communicating ideas or concepts. Similar to brainstorming, however, does not necessarily occur in a group.
mind map	A diagram used to connect words or ideas around a central theme or key idea. Ideas are presented in a radial, non-linear way which lends itself well to brainstorming or classifying ideas.
mock-up	Scale or full-size, usually non-functional, model of a product.
NCI	New Concept Incubator department at Roche Diagnostics, Palo Alto, CA.
persona	A narrative created around a composite of researched individuals, relating to a user's typical day or pattern of behaviors, to help inform design decisions.
platform	In computing, a platform can include the hardware, operating system, or programming language etc. that allow software to run. In design, this term is expanded to encompass the architecture, hardware, system, or delivery method of a product or service. For example, the platforms I use to record my schedule are a PDA and an agenda book.
process book	A book that documents the design process and decisions made to create the final design. Although the design process is iterative, the process book typically follows a linear progression to make the process easier to follow. This is typically one of the deliverables in an industrial design class, but it can also be used to present concepts to a client.
product	A material object that is produced; a result of labor; an outcome. A thing that can be bought, sold, rented, owned, gifted etc. Includes everything from the mundane objects of everyday life such as toothbrushes and pencils that are mass produced to rare, handcrafted collectibles.
segment	In this report, segment is a term that comes from marketing which refers to

a group of people that share certain characteristics that affect their product or service needs.

service Performance of duties or work. Intangible, non-material acts or processes that are usually exchanged for payment. For example, a barber performs the service of cutting hair.